



06/14/13

Technical Report for

Aquaterra Technologies, Inc.

Sun-Marcus Hook Refinery, Philadelphia, PA

AOI-5

Accutest Job Number: JB37147

Sampling Date: 05/15/13

Report to:

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Total number of pages in report: 244



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

**Nancy Cole
Laboratory Director**

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Certifications: NJ(12129), NY(10983), CA, CT, DE, FL, IL, IN, KS, KY, LA, MA, MD, MI, MT, NC, OH VAP (CL0056), PA, RI, SC, TN, VA, WV

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Test results relate only to samples analyzed.

Table of Contents

-1-

Section 1: Sample Summary	4	1
Section 2: Case Narrative/Conformance Summary	5	2
Section 3: Summary of Hits	8	3
Section 4: Sample Results	9	4
4.1: JB37147-1: AOI-5_MW-441_8-10'_51513	10	5
4.2: JB37147-2: AOI-5_MW-441_0-2'_51513	14	6
4.3: JB37147-3: AOI-5_MW-449_2-2'_51513	18	7
4.4: JB37147-4: AOI-5_MW-445_3-3.5'_51513	22	8
Section 5: Misc. Forms	26	9
5.1: Chain of Custody	27	10
5.2: Sample Tracking Chronicle	29	11
5.3: Internal Chain of Custody	30	12
Section 6: GC/MS Volatiles - QC Data Summaries	32	13
6.1: Method Blank Summary	33	14
6.2: Blank Spike Summary	36	15
6.3: Matrix Spike Summary	38	
6.4: Matrix Spike/Matrix Spike Duplicate Summary	39	
6.5: Duplicate Summary	40	
6.6: Instrument Performance Checks (BFB)	41	
6.7: Internal Standard Area Summaries	45	
6.8: Surrogate Recovery Summaries	48	
6.9: Initial and Continuing Calibration Summaries	49	
Section 7: GC/MS Volatiles - Raw Data	69	
7.1: Samples	70	
7.2: Method Blanks	83	
Section 8: Misc. Forms (Accutest Labs of New England, Inc.)	87	
8.1: Chain of Custody	88	
8.2: Sample Tracking Chronicle	91	
8.3: Internal Chain of Custody	92	
Section 9: GC/MS Semi-volatiles - QC Data (Accutest Labs of New England, Inc.)	93	
9.1: Method Blank Summary	94	
9.2: Blank Spike Summary	95	
9.3: Matrix Spike/Matrix Spike Duplicate Summary	96	
9.4: Instrument Performance Checks (DFTPP)	97	
9.5: Internal Standard Area Summaries	100	
9.6: Surrogate Recovery Summaries	102	
9.7: Initial and Continuing Calibration Summaries	103	
Section 10: GC/MS Semi-volatiles - Raw Data (Accutest Labs of New England, Inc.)	122	
10.1: Samples	123	
10.2: Method Blanks	144	
Section 11: GC Volatiles - QC Data (Accutest Labs of New England, Inc.)	146	
11.1: Method Blank Summary	147	

Table of Contents

-2-

11.2: Blank Spike Summary	148
11.3: Matrix Spike/Matrix Spike Duplicate Summary	149
11.4: Surrogate Recovery Summaries	150
11.5: GC Surrogate Retention Time Summaries	151
11.6: Initial and Continuing Calibration Summaries	153
Section 12: GC Volatiles - Raw Data (Accutest Labs of New England, Inc.)	157
12.1: Samples	158
12.2: Method Blanks	174
Section 13: Metals Analysis - QC Data (Accutest Labs of New England, Inc.)	178
13.1: Inst QC MA15650: Pb	179
13.2: Inst QC MA15657: Pb	205
13.3: Prep QC MP21026: Pb	229
Section 14: General Chemistry - QC Data (Accutest Labs of New England, Inc.)	241
14.1: Percent Solids Raw Data Summary	242
Section 15: General Chemistry - QC Data Summaries	243
15.1: Percent Solids Raw Data Summary	244

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15



Sample Summary

Aquaterra Technologies, Inc.

Job No: JB37147

Sun-Marcus Hook Refinery, Philadelphia, PA
Project No: AOI-5

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JB37147-1	05/15/13	12:00 LM	05/15/13	SO	Soil	AOI-5_MW-441_8-10'_51513
JB37147-2	05/15/13	09:00 LM	05/15/13	SO	Soil	AOI-5_MW-441_0-2'_51513
JB37147-3	05/15/13	14:00 LM	05/15/13	SO	Soil	AOI-5_MW-449_2-2'_51513
JB37147-4	05/15/13	10:55 LM	05/15/13	SO	Soil	AOI-5_MW-445_3-3.5'_51513

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Aquaterra Technologies, Inc.

Job No JB37147

Site: Sun-Marcus Hook Refinery, Philadelphia, PA

Report Date 6/14/2013 10:13:53 A

On 05/15/2013, 4 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at Accutest Laboratories at a temperature of 2.7 C. Samples were intact and chemically preserved, unless noted below. An Accutest Job Number of JB37147 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix: SO

Batch ID: VY5787

- All samples were analyzed within the recommended method holding time.
- Sample(s) JB37162-2MS, JB37162-2MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- RPD(s) for MSD for 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Benzene, Ethylbenzene, Isopropylbenzene, Toluene, Xylene (total) are outside control limits for sample JB37162-2MSD. Outside control limits due to matrix interference.

Matrix: SO

Batch ID: VY5790

- All samples were analyzed within the recommended method holding time.
- Sample(s) JB37342-2DUP, JB37127-3MS were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- Matrix Spike Recovery(s) for 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Benzene, Xylene (total) are outside control limits. Outside control limits due to matrix interference.
- RPD(s) for Duplicate for Benzene, Ethylbenzene, Methyl Tert Butyl Ether, Toluene, Xylene (total) are outside control limits for sample JB37342-2DUP.

Extractables by GCMS By Method SW846 8270C

Matrix: SO

Batch ID: M:OP33326

- The data for SW846 8270C meets quality control requirements.
- JB37147-1: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB37147-4: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB37147-3: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB37147-2: Analysis performed at Accutest Laboratories, Marlborough, MA.

Volatiles by GC By Method SW846 8011

Matrix: SO

Batch ID: M:OP33301

- The data for SW846 8011 meets quality control requirements.
- JB37147-2: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB37147-3: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB37147-4: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB37147-1: Analysis performed at Accutest Laboratories, Marlborough, MA.

Metals By Method SW846 6010C

Matrix: SO

Batch ID: M:MP21026

- The data for SW846 6010C meets quality control requirements.
- JB37147-2 for Lead: Elevated RL due to dilution required for matrix interference. Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB37147-1 for Lead: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB37147-3 for Lead: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB37147-4 for Lead: Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method SM21 2540 B MOD.

Matrix: SO

Batch ID: M:GN42874

- The data for SM21 2540 B MOD. meets quality control requirements.
- JB37147-1 for Solids, Percent: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB37147-2 for Solids, Percent: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB37147-3 for Solids, Percent: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB37147-4 for Solids, Percent: Analysis performed at Accutest Laboratories, Marlborough, MA.

Accutest certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting Accutest's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

Accutest Laboratories is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by Accutest Laboratories indicated via signature on the report cover



SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Accutest New Jersey

Job No JB37147

Site: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Report Date 6/13/2013 2:42:58 PM

4 Sample(s) were collected on 05/15/2013 and were received at Accutest of NJ on 05/15/2013, at Accutest of NE on 05/17/2013, properly preserved, at 0.9 Deg. C and intact. These Samples received an Accutest job number of JB37147. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Extractables by GCMS By Method SW846 8270C

Matrix SO	Batch ID: OP33326
------------------	--------------------------

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC20894-1MS, MC20894-1MSD were used as the QC samples indicated.

Volatiles by GC By Method SW846 8011

Matrix SO	Batch ID: OP33301
------------------	--------------------------

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JB36591-1MS, JB36591-1MSD were used as the QC samples indicated.

Metals By Method SW846 6010C

Matrix SO	Batch ID: MP21026
------------------	--------------------------

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC21006-6MSD, MC21006-6MS, MC21006-6SDL were used as the QC samples for metals.
- JB37147-2 for Lead: Elevated RL due to dilution required for matrix interference.
- MP21026-SD1 for Lead: Serial dilution indicates possible matrix interference.

Wet Chemistry By Method SM21 2540 B MOD.

Matrix SO	Batch ID: GN42874
------------------	--------------------------

- Sample(s) JB37147-1DUP were used as the QC samples for Solids, Percent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(JB37147).

Summary of Hits

Job Number: JB37147
 Account: Aquaterra Technologies, Inc.
 Project: Sun-Marcus Hook Refinery, Philadelphia, PA
 Collected: 05/15/13

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JB37147-1	AOI-5_MW-441_8-10'_51513					
Methyl Tert Butyl Ether	0.0023	0.0011	0.00025	mg/kg	SW846 8260B	
Lead ^a	7.0	1.0	0.17	mg/kg	SW846 6010C	
JB37147-2	AOI-5_MW-441_0-2'_51513					
Lead ^b	44.2	9.8	1.6	mg/kg	SW846 6010C	
JB37147-3	AOI-5_MW-449_2-2'_51513					
Lead ^a	5.8	1.0	0.17	mg/kg	SW846 6010C	
JB37147-4	AOI-5_MW-445_3-3.5'_51513					
Benzene	0.0055	0.00097	0.00012	mg/kg	SW846 8260B	
Toluene	0.00094 J	0.00097	0.00010	mg/kg	SW846 8260B	
Ethylbenzene	0.0057	0.00097	0.00026	mg/kg	SW846 8260B	
Xylene (total)	0.0144	0.00097	0.00013	mg/kg	SW846 8260B	
Isopropylbenzene	0.0048 J	0.0049	0.000072	mg/kg	SW846 8260B	
1,2,4-Trimethylbenzene	0.0204	0.0049	0.00020	mg/kg	SW846 8260B	
1,3,5-Trimethylbenzene	0.0123	0.0049	0.00016	mg/kg	SW846 8260B	
Anthracene ^a	0.0604 J	0.12	0.042	mg/kg	SW846 8270C	
Benzo(a)anthracene ^a	0.0609 J	0.12	0.047	mg/kg	SW846 8270C	
Benzo(a)pyrene ^a	0.0409 J	0.12	0.028	mg/kg	SW846 8270C	
Benzo(b)fluoranthene ^a	0.0478 J	0.12	0.029	mg/kg	SW846 8270C	
Benzo(g,h,i)perylene ^a	0.0638 J	0.12	0.055	mg/kg	SW846 8270C	
Chrysene ^a	0.0775 J	0.12	0.049	mg/kg	SW846 8270C	
Fluorene ^a	0.0605 J	0.12	0.043	mg/kg	SW846 8270C	
Naphthalene ^a	0.115 J	0.12	0.047	mg/kg	SW846 8270C	
Phenanthrene ^a	0.191	0.12	0.037	mg/kg	SW846 8270C	
Pyrene ^a	0.236	0.12	0.037	mg/kg	SW846 8270C	
Lead ^a	28.1	0.99	0.17	mg/kg	SW846 6010C	

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

(b) Elevated RL due to dilution required for matrix interference. Analysis performed at Accutest Laboratories, Marlborough, MA.



4

Sample Results

Report of Analysis

Accutest Laboratories

Report of Analysis

Page 1 of 1

Client Sample ID: AOI-5_MW-441_8-10'_51513

Lab Sample ID: JB37147-1

Date Sampled: 05/15/13

Matrix: SO - Soil

Date Received: 05/15/13

Method: SW846 8260B

Percent Solids: 82.0

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Y134392.D	1	05/19/13	RS	n/a	n/a	VY5787
Run #2							

Initial Weight

Run #1 5.7 g

Run #2

Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.0011	0.00013	mg/kg	
108-88-3	Toluene	ND	0.0011	0.00011	mg/kg	
100-41-4	Ethylbenzene	ND	0.0011	0.00028	mg/kg	
1330-20-7	Xylene (total)	ND	0.0011	0.00015	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	0.0023	0.0011	0.00025	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0011	0.00014	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0053	0.000079	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0053	0.00022	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0053	0.00017	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		70-130%
17060-07-0	1,2-Dichloroethane-D4	90%		70-122%
2037-26-5	Toluene-D8	104%		81-127%
460-00-4	4-Bromofluorobenzene	104%		66-132%

ND = Not detected MDL - Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Page 1 of 1

Client Sample ID: AOI-5_MW-441_8-10'_51513

Lab Sample ID: JB37147-1

Date Sampled: 05/15/13

Matrix: SO - Soil

Date Received: 05/15/13

Method: SW846 8270C SW846 3546

Percent Solids: 82.0

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	F64584.D	1	05/29/13	AMA	05/25/13	M:OP33326	M:MSF3012

Run #1	Initial Weight	Final Volume
Run #1	20.4 g	1.0 ml
Run #2		

BN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	0.12	0.041	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.12	0.046	mg/kg	
50-32-8	Benzo(a)pyrene	ND	0.12	0.028	mg/kg	
205-99-2	Benzo(b)fluoranthene	ND	0.12	0.028	mg/kg	
191-24-2	Benzo(g,h,i)perylene	ND	0.12	0.054	mg/kg	
218-01-9	Chrysene	ND	0.12	0.048	mg/kg	
86-73-7	Fluorene	ND	0.12	0.042	mg/kg	
91-20-3	Naphthalene	ND	0.12	0.046	mg/kg	
85-01-8	Phenanthrene	ND	0.12	0.036	mg/kg	
129-00-0	Pyrene	ND	0.12	0.036	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	75%		30-130%
321-60-8	2-Fluorobiphenyl	70%		30-130%
1718-51-0	Terphenyl-d14	76%		30-130%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Page 1 of 1

Client Sample ID: AOI-5_MW-441_8-10'_51513

Lab Sample ID: JB37147-1

Date Sampled: 05/15/13

Matrix: SO - Soil

Date Received: 05/15/13

Method: SW846 8011 SW846 8011

Percent Solids: 82.0

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	BK25128.D	1	05/24/13	AMA	05/23/13	M:OP33301	M:GBK874
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	50.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.0030	0.0012	mg/kg	
CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits						
460-00-4	Bromofluorobenzene (S)	126%			61-167%	
460-00-4	Bromofluorobenzene (S)	143%			61-167%	

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID: AOI-5_MW-441_8-10'_51513
Lab Sample ID: JB37147-1
Matrix: SO - Soil
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

4.1

4

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Lead ^a	7.0	1.0	0.17	mg/kg	1	05/22/13	05/23/13	AMA SW846 6010C ¹	SW846 3050B ²

(1) Instrument QC Batch: M:MA15650

(2) Prep QC Batch: M:MP21026

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Page 1 of 1

4.2
4

Client Sample ID: AOI-5_MW-441_0-2'_51513

Lab Sample ID: JB37147-2

Date Sampled: 05/15/13

Matrix: SO - Soil

Date Received: 05/15/13

Method: SW846 8260B

Percent Solids: 90.5

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Y134393.D	1	05/19/13	RS	n/a	n/a	VY5787
Run #2							

Initial Weight

Run #1 9.6 g

Run #2

Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.00058	0.000068	mg/kg	
108-88-3	Toluene	ND	0.00058	0.000060	mg/kg	
100-41-4	Ethylbenzene	ND	0.00058	0.00015	mg/kg	
1330-20-7	Xylene (total)	ND	0.00058	0.000080	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.00058	0.00014	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.00058	0.000078	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0029	0.000043	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0029	0.00012	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0029	0.000092	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	82%		70-130%
17060-07-0	1,2-Dichloroethane-D4	88%		70-122%
2037-26-5	Toluene-D8	103%		81-127%
460-00-4	4-Bromofluorobenzene	104%		66-132%

ND = Not detected MDL - Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Page 1 of 1

4.2
4

Client Sample ID: AOI-5_MW-441_0-2'_51513
Lab Sample ID: JB37147-2
Matrix: SO - Soil
Method: SW846 8270C SW846 3546
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Date Sampled: 05/15/13
Date Received: 05/15/13
Percent Solids: 90.5

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	F64585.D	1	05/29/13	AMA	05/25/13	M:OP33326	M:MSF3012
Run #2							

Run #1	Initial Weight	Final Volume
Run #1	10.4 g	1.0 ml
Run #2		

BN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	0.21	0.073	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.21	0.082	mg/kg	
50-32-8	Benzo(a)pyrene	ND	0.21	0.049	mg/kg	
205-99-2	Benzo(b)fluoranthene	ND	0.21	0.050	mg/kg	
191-24-2	Benzo(g,h,i)perylene	ND	0.21	0.096	mg/kg	
218-01-9	Chrysene	ND	0.21	0.086	mg/kg	
86-73-7	Fluorene	ND	0.21	0.075	mg/kg	
91-20-3	Naphthalene	ND	0.21	0.082	mg/kg	
85-01-8	Phenanthrene	ND	0.21	0.064	mg/kg	
129-00-0	Pyrene	ND	0.21	0.065	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	77%		30-130%
321-60-8	2-Fluorobiphenyl	70%		30-130%
1718-51-0	Terphenyl-d14	78%		30-130%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Page 1 of 1

4.2

4

Client Sample ID: AOI-5_MW-441_0-2'_51513
Lab Sample ID: JB37147-2
Matrix: SO - Soil
Method: SW846 8011 SW846 8011
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Date Sampled: 05/15/13
 Date Received: 05/15/13
 Percent Solids: 90.5

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	BK25129.D	1	05/24/13	AMA	05/23/13	M:OP33301	M:GBK874
Run #2							

	Initial Weight	Final Volume
Run #1	30.6 g	50.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.0027	0.0010	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
460-00-4	Bromofluorobenzene (S)	122%		61-167%		
460-00-4	Bromofluorobenzene (S)	136%		61-167%		

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID: AOI-5_MW-441_0-2'_51513
Lab Sample ID: JB37147-2
Matrix: SO - Soil
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Date Sampled: 05/15/13
Date Received: 05/15/13
Percent Solids: 90.5

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Lead ^a	44.2	9.8	1.6	mg/kg	10	05/22/13	05/24/13	AMA SW846 6010C ¹	SW846 3050B ²

- (1) Instrument QC Batch: M:MA15657
 (2) Prep QC Batch: M:MP21026

(a) Elevated RL due to dilution required for matrix interference. Analysis performed at Accutest Laboratories, Marlborough, MA.

RL = Reporting Limit
 MDL = Method Detection Limit

U = Indicates a result < MDL
 B = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Page 1 of 1

4.3
4

Client Sample ID: AOI-5_MW-449_2-2'_51513

Lab Sample ID: JB37147-3

Date Sampled: 05/15/13

Matrix: SO - Soil

Date Received: 05/15/13

Method: SW846 8260B

Percent Solids: 89.0

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Y134394.D	1	05/19/13	RS	n/a	n/a	VY5787
Run #2							

Initial Weight

Run #1 6.1 g

Run #2

Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.00092	0.00011	mg/kg	
108-88-3	Toluene	ND	0.00092	0.000097	mg/kg	
100-41-4	Ethylbenzene	ND	0.00092	0.00024	mg/kg	
1330-20-7	Xylene (total)	ND	0.00092	0.00013	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.00092	0.00022	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.00092	0.00012	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0046	0.000068	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0046	0.00019	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0046	0.00015	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%		70-130%
17060-07-0	1,2-Dichloroethane-D4	90%		70-122%
2037-26-5	Toluene-D8	103%		81-127%
460-00-4	4-Bromofluorobenzene	105%		66-132%

ND = Not detected MDL - Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Page 1 of 1

4.3
4

Client Sample ID:	AOI-5_MW-449_2-2'_51513	Date Sampled:	05/15/13
Lab Sample ID:	JB37147-3	Date Received:	05/15/13
Matrix:	SO - Soil	Percent Solids:	89.0
Method:	SW846 8270C SW846 3546		
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	F64586.D	1	05/29/13	AMA	05/25/13	M:OP33326	M:MSF3012

	Initial Weight	Final Volume
Run #1	20.5 g	1.0 ml
Run #2		

BN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	0.11	0.038	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.11	0.042	mg/kg	
50-32-8	Benzo(a)pyrene	ND	0.11	0.025	mg/kg	
205-99-2	Benzo(b)fluoranthene	ND	0.11	0.026	mg/kg	
191-24-2	Benzo(g,h,i)perylene	ND	0.11	0.049	mg/kg	
218-01-9	Chrysene	ND	0.11	0.044	mg/kg	
86-73-7	Fluorene	ND	0.11	0.039	mg/kg	
91-20-3	Naphthalene	ND	0.11	0.042	mg/kg	
85-01-8	Phenanthrene	ND	0.11	0.033	mg/kg	
129-00-0	Pyrene	ND	0.11	0.033	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	77%		30-130%
321-60-8	2-Fluorobiphenyl	74%		30-130%
1718-51-0	Terphenyl-d14	79%		30-130%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Page 1 of 1

4.3
4

Client Sample ID: AOI-5_MW-449_2-2'_51513
Lab Sample ID: JB37147-3
Matrix: SO - Soil
Method: SW846 8011 SW846 8011
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Date Sampled: 05/15/13
 Date Received: 05/15/13
 Percent Solids: 89.0

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	BK25130.D	1	05/24/13	AMA	05/23/13	M:OP33301	M:GBK874
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	50.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.0028	0.0011	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
460-00-4	Bromofluorobenzene (S)	128%		61-167%		
460-00-4	Bromofluorobenzene (S)	154%		61-167%		

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID: AOI-5_MW-449_2-2'_51513
Lab Sample ID: JB37147-3
Matrix: SO - Soil
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Date Sampled: 05/15/13
Date Received: 05/15/13
Percent Solids: 89.0

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Lead ^a	5.8	1.0	0.17	mg/kg	1	05/22/13	05/23/13	AMA	SW846 6010C ¹	SW846 3050B ²

(1) Instrument QC Batch: M:MA15650

(2) Prep QC Batch: M:MP21026

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Page 1 of 1

Client Sample ID: AOI-5_MW-445_3-3.5'_51513

Lab Sample ID: JB37147-4

Date Sampled: 05/15/13

Matrix: SO - Soil

Date Received: 05/15/13

Method: SW846 8260B

Percent Solids: 81.8

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Y134458.D	1	05/21/13	RS	n/a	n/a	VY5790
Run #2							

	Initial Weight
Run #1	6.3 g
Run #2	

Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	0.0055	0.00097	0.00012	mg/kg	
108-88-3	Toluene	0.00094	0.00097	0.00010	mg/kg	J
100-41-4	Ethylbenzene	0.0057	0.00097	0.00026	mg/kg	
1330-20-7	Xylene (total)	0.0144	0.00097	0.00013	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.00097	0.00023	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.00097	0.00013	mg/kg	
98-82-8	Isopropylbenzene	0.0048	0.0049	0.000072	mg/kg	J
95-63-6	1,2,4-Trimethylbenzene	0.0204	0.0049	0.00020	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	0.0123	0.0049	0.00016	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	108%		70-130%
17060-07-0	1,2-Dichloroethane-D4	106%		70-122%
2037-26-5	Toluene-D8	108%		81-127%
460-00-4	4-Bromofluorobenzene	107%		66-132%

ND = Not detected MDL - Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Page 1 of 1

Client Sample ID: AOI-5_MW-445_3-3.5'_51513

Lab Sample ID: JB37147-4

Date Sampled: 05/15/13

Matrix: SO - Soil

Date Received: 05/15/13

Method: SW846 8270C SW846 3546

Percent Solids: 81.8

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	F64587.D	1	05/29/13	AMA	05/25/13	M:OP33326	M:MSF3012

Run #1	Initial Weight	Final Volume
Run #1	20.1 g	1.0 ml
Run #2		

BN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	0.0604	0.12	0.042	mg/kg	J
56-55-3	Benzo(a)anthracene	0.0609	0.12	0.047	mg/kg	J
50-32-8	Benzo(a)pyrene	0.0409	0.12	0.028	mg/kg	J
205-99-2	Benzo(b)fluoranthene	0.0478	0.12	0.029	mg/kg	J
191-24-2	Benzo(g,h,i)perylene	0.0638	0.12	0.055	mg/kg	J
218-01-9	Chrysene	0.0775	0.12	0.049	mg/kg	J
86-73-7	Fluorene	0.0605	0.12	0.043	mg/kg	J
91-20-3	Naphthalene	0.115	0.12	0.047	mg/kg	J
85-01-8	Phenanthrene	0.191	0.12	0.037	mg/kg	
129-00-0	Pyrene	0.236	0.12	0.037	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	70%		30-130%
321-60-8	2-Fluorobiphenyl	71%		30-130%
1718-51-0	Terphenyl-d14	80%		30-130%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Page 1 of 1

Client Sample ID: AOI-5_MW-445_3-3.5'_51513

Lab Sample ID: JB37147-4

Date Sampled: 05/15/13

Matrix: SO - Soil

Date Received: 05/15/13

Method: SW846 8011 SW846 8011

Percent Solids: 81.8

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	BK25131.D	1	05/24/13	AMA	05/23/13	M:OP33301	M:GBK874
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	50.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.0030	0.0012	mg/kg	
CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits						
460-00-4	Bromofluorobenzene (S)	118%			61-167%	
460-00-4	Bromofluorobenzene (S)	149%			61-167%	

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID: AOI-5_MW-445_3-3.5'_51513
Lab Sample ID: JB37147-4
Matrix: SO - Soil
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Date Sampled: 05/15/13
Date Received: 05/15/13
Percent Solids: 81.8

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Lead ^a	28.1	0.99	0.17	mg/kg	1	05/22/13	05/23/13	AMA SW846 6010C ¹	SW846 3050B ²

(1) Instrument QC Batch: M:MA15650

(2) Prep QC Batch: M:MP21026

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL



Misc. Forms

5

Custody Documents and Other Forms

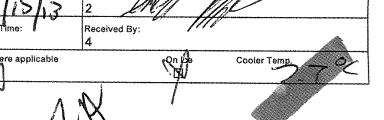
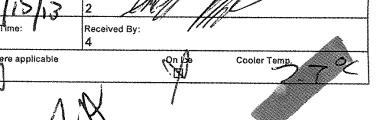
Includes the following where applicable:

- Chain of Custody
- Sample Tracking Chronicle
- Internal Chain of Custody

CHAIN OF CUSTODY

2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.accutest.com

PAGE 1 OF 1

Client / Reporting Information		Project Information		Requested Analysis (see TEST CODE sheet)		Matrix Codes	
Company Name AQUATERRA TECHNOLOGIES	Project Name: MARCUS Hook REFINERY	Street					
Street Address 122 So. Clark St							DW - Drinking Water
City West Chester State PA Zip 19382	City	State	Billing Information (if different from Report to) Company Name				GW - Ground Water
Project Contact L. Wang D.C.	E-mail	Project #	Street Address				WW - Water
Phone #	Fax #	Client Purchase Order #	City	State	Zip		SW - Surface Water
Sampler(s) Name(s) Luke Morycuk, Yusus Gunayr	Phone #	Project Manager Jim Oppenheim	Attention:				SO - Soil
							SL - Sludge
							SED - Sediment
							OI - Oil
							LIQ - Other Liquid
							AIR - Air
							SOL - Other Solid
							WP - Wipe
							FB - Field Blank
							EB - Equipment Blank
							RB - Rinse Blank
							TB - Trip Blank
ATTACHMENT							
RECEIVED							
2014-05-15							
ANALYSIS							
REPORT							
SUB							
14 Q6							
4013							
LAB USE ONLY							
Turnaround Time (Business days)		Data Deliverable Information				Comments / Special Instructions	
<input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 3 Day EMERGENCY <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY <input type="checkbox"/> other Emergency 3 Rush TIA data available VIA Lablink		Approved By (Accutest PM): / Date: <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>				<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> FULLT1 (Level 3+4) <input checked="" type="checkbox"/> NJ Reduced <input type="checkbox"/> Commercial "C" Commercial "A" = Results Only Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data	
Sample Custody must be documented below each time samples change possession, including courier delivery.							
Relinquished by Sampler: 1	Date Time: 1530 5/15/13	Received By: 1	Relinquished By: 2	Date Time: 5/15/13	Received By: 2	Preserved where applicable <input type="checkbox"/> Intact <input type="checkbox"/> Not Intact	
Relinquished by Sampler: 3	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4	 27°C	
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal #			 27°C	

JB37147: Chain of Custody

Page 1 of 2



Accutest Laboratories Sample Receipt Summary

Accutest Job Number: JB37147

Client: _____

Project: _____

Date / Time Received: 5/15/2013

Delivery Method: _____

Airbill #'s: _____

Cooler Temps (Initial/Adjusted): #1: (2.7/2.7); 0

Cooler Security Y or N

- | | | | | | |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Cooler Temperature Y or N

- | | | |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | _____ | |
| 3. Cooler media: | Ice (Bag) | |
| 4. No. Coolers: | 1 | |

Quality Control Preservation Y or N N/A

- | | | | |
|---------------------------------|-------------------------------------|-------------------------------------|--------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Trip Blank listed on COC: | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Samples preserved properly: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 4. VOCs headspace free: | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Sample Integrity - DocumentationY or N

- | | | |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Sample Integrity - ConditionY or N

- | | | |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recv'd within HT: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample: | Intact | |

Sample Integrity - InstructionsY or N N/A

- | | | |
|---|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Bottles received for unspecified tests | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Sufficient volume recv'd for analysis: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. Compositing instructions clear: | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Filtering instructions clear: | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Comments

Accutest Laboratories
V:732.329.02002235 US Highway 130
F: 732.329.3499Dayton, New Jersey
www.accutest.com**JB37147: Chain of Custody****Page 2 of 2**

Accutest Laboratories

Internal Sample Tracking Chronicle

Aquaterra Technologies, Inc.

Job No: JB37147

Sun-Marcus Hook Refinery, Philadelphia, PA
Project No: AOI-5

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JB37147-1	Collected: 15-MAY-13 12:00 By: LM	Received: 15-MAY-13 By: MB				
	AOI-5_MW-441_8-10'_51513					
JB37147-1	SW846 8260B	19-MAY-13 07:52	RS			V8260SL
JB37147-1	SM21 2540 B MOD.	20-MAY-13	AMA			%SOL
JB37147-1	SW846 6010C	23-MAY-13 20:07	AMA	22-MAY-13 AMA	PB	
JB37147-1	SW846 8011	24-MAY-13 16:37	AMA	23-MAY-13 AMA	V8011EDB	
JB37147-1	SW846 8270C	29-MAY-13 18:26	AMA	25-MAY-13 AMA	B8270SL	
JB37147-2	Collected: 15-MAY-13 09:00 By: LM	Received: 15-MAY-13 By: MB				
	AOI-5_MW-441_0-2'_51513					
JB37147-2	SW846 8260B	19-MAY-13 08:21	RS			V8260SL
JB37147-2	SM21 2540 B MOD.	20-MAY-13	AMA			%SOL
JB37147-2	SW846 6010C	24-MAY-13 14:46	AMA	22-MAY-13 AMA	PB	
JB37147-2	SW846 8011	24-MAY-13 17:01	AMA	23-MAY-13 AMA	V8011EDB	
JB37147-2	SW846 8270C	29-MAY-13 18:49	AMA	25-MAY-13 AMA	B8270SL	
JB37147-3	Collected: 15-MAY-13 14:00 By: LM	Received: 15-MAY-13 By: MB				
	AOI-5_MW-449_2-2'_51513					
JB37147-3	SW846 8260B	19-MAY-13 08:49	RS			V8260SL
JB37147-3	SM21 2540 B MOD.	20-MAY-13	AMA			%SOL
JB37147-3	SW846 6010C	23-MAY-13 20:11	AMA	22-MAY-13 AMA	PB	
JB37147-3	SW846 8011	24-MAY-13 17:25	AMA	23-MAY-13 AMA	V8011EDB	
JB37147-3	SW846 8270C	29-MAY-13 19:12	AMA	25-MAY-13 AMA	B8270SL	
JB37147-4	Collected: 15-MAY-13 10:55 By: LM	Received: 15-MAY-13 By: MB				
	AOI-5_MW-445_3-3.5'_51513					
JB37147-4	SM21 2540 B MOD.	20-MAY-13	AMA			%SOL
JB37147-4	SW846 8260B	21-MAY-13 18:59	RS			V8260SL
JB37147-4	SW846 6010C	23-MAY-13 20:15	AMA	22-MAY-13 AMA	PB	
JB37147-4	SW846 8011	24-MAY-13 17:48	AMA	23-MAY-13 AMA	V8011EDB	
JB37147-4	SW846 8270C	29-MAY-13 19:34	AMA	25-MAY-13 AMA	B8270SL	

Accutest Internal Chain of Custody

Page 1 of 2

Job Number: JB37147
Account: AQTAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Received: 05/15/13

Sample/Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JB37147-1.1	Secured Storage	Dave Hunkel	05/16/13 14:50	Retrieve from Storage
JB37147-1.1	Dave Hunkel		05/16/13 14:52	Subcontract
JB37147-1.2	Secured Storage	Robert Lofrano	05/21/13 11:10	Retrieve from Storage
JB37147-1.2	Robert Lofrano		05/21/13 13:21	Subcontract
JB37147-1.4	Secured Storage	Robert Szot	05/18/13 11:59	Retrieve from Storage
JB37147-1.4	Robert Szot	GCMSY	05/18/13 11:59	Load on Instrument
JB37147-1.4	GCMSY	Robert Szot	05/22/13 17:18	Unload from Instrument
JB37147-1.4	Robert Szot		05/22/13 17:18	Depleted
JB37147-2.1	Secured Storage	Dave Hunkel	05/16/13 14:50	Retrieve from Storage
JB37147-2.1	Dave Hunkel		05/16/13 14:52	Subcontract
JB37147-2.2	Secured Storage	Robert Lofrano	05/21/13 11:10	Retrieve from Storage
JB37147-2.2	Robert Lofrano		05/21/13 13:21	Subcontract
JB37147-2.4	Secured Storage	Robert Szot	05/18/13 11:59	Retrieve from Storage
JB37147-2.4	Robert Szot	GCMSY	05/18/13 11:59	Load on Instrument
JB37147-2.4	GCMSY	Robert Szot	05/22/13 17:18	Unload from Instrument
JB37147-2.4	Robert Szot		05/22/13 17:18	Depleted
JB37147-3.1	Secured Storage	Dave Hunkel	05/16/13 14:50	Retrieve from Storage
JB37147-3.1	Dave Hunkel		05/16/13 14:52	Subcontract
JB37147-3.2	Secured Storage	Robert Lofrano	05/21/13 11:10	Retrieve from Storage
JB37147-3.2	Robert Lofrano		05/21/13 13:21	Subcontract
JB37147-3.4	Secured Storage	Robert Szot	05/18/13 11:59	Retrieve from Storage
JB37147-3.4	Robert Szot	GCMSY	05/18/13 11:59	Load on Instrument
JB37147-3.4	GCMSY	Robert Szot	05/22/13 17:18	Unload from Instrument
JB37147-3.4	Robert Szot		05/22/13 17:18	Depleted
JB37147-4.1	Secured Storage	Dave Hunkel	05/16/13 14:50	Retrieve from Storage
JB37147-4.1	Dave Hunkel		05/16/13 14:52	Subcontract
JB37147-4.2	Secured Storage	Robert Lofrano	05/21/13 11:10	Retrieve from Storage
JB37147-4.2	Robert Lofrano		05/21/13 13:21	Subcontract
JB37147-4.4	Secured Storage	Robert Szot	05/18/13 11:59	Retrieve from Storage
JB37147-4.4	Robert Szot	GCMSY	05/18/13 11:59	Load on Instrument
JB37147-4.4	GCMSY	Robert Szot	05/22/13 17:18	Unload from Instrument
JB37147-4.4	Robert Szot		05/22/13 17:18	Depleted

Accutest Internal Chain of Custody

Job Number: JB37147
 Account: AQTAW Aquaterra Technologies, Inc.
 Project: Sun-Marcus Hook Refinery, Philadelphia, PA
 Received: 05/15/13

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JB37147-4.5	Secured Storage	Robert Szot	05/21/13 17:02	Retrieve from Storage
JB37147-4.5	Robert Szot	GCMSY	05/21/13 17:02	Load on Instrument
JB37147-4.5	GCMSY	Robert Szot	05/22/13 17:18	Unload from Instrument
JB37147-4.5	Robert Szot		05/22/13 17:18	Depleted



GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Instrument Performance Checks (BFB)
- Internal Standard Area Summaries
- Surrogate Recovery Summaries
- Initial and Continuing Calibration Summaries



Method Blank Summary

Job Number: JB37147

Account: AQTPAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VY5787-MB	Y134374.D	1	05/18/13	RS	n/a	n/a	VY5787

The QC reported here applies to the following samples:

Method: SW846 8260B

JB37147-1, JB37147-2, JB37147-3

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.12	ug/kg	
107-06-2	1,2-Dichloroethane	ND	1.0	0.14	ug/kg	
100-41-4	Ethylbenzene	ND	1.0	0.26	ug/kg	
98-82-8	Isopropylbenzene	ND	5.0	0.074	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.24	ug/kg	
108-88-3	Toluene	ND	1.0	0.11	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.21	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.16	ug/kg	
1330-20-7	Xylene (total)	ND	1.0	0.14	ug/kg	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	99%
17060-07-0	1,2-Dichloroethane-D4	89%
2037-26-5	Toluene-D8	102%
460-00-4	4-Bromofluorobenzene	106%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	system artifact	16.52	10	ug/kg	J
	Total TIC, Volatile		0	ug/kg	

Method Blank Summary

Job Number: JB37147

Account: AQTPAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VY5790-MB	Y134446.D	1	05/21/13	RS	n/a	n/a	VY5790

The QC reported here applies to the following samples:

Method: SW846 8260B

JB37147-4

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.12	ug/kg	
107-06-2	1,2-Dichloroethane	ND	1.0	0.14	ug/kg	
100-41-4	Ethylbenzene	ND	1.0	0.26	ug/kg	
98-82-8	Isopropylbenzene	ND	5.0	0.074	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.24	ug/kg	
108-88-3	Toluene	ND	1.0	0.11	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.21	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.16	ug/kg	
1330-20-7	Xylene (total)	ND	1.0	0.14	ug/kg	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	101%
17060-07-0	1,2-Dichloroethane-D4	92%
2037-26-5	Toluene-D8	108%
460-00-4	4-Bromofluorobenzene	101%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	system artifact	16.52	6.2	ug/kg	J
	Total TIC, Volatile		0	ug/kg	

Method Blank Summary

Job Number: JB37147

Account: AQTPAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VY5790-MB2	Y134495.D	1	05/22/13	RS	n/a	n/a	VY5790

The QC reported here applies to the following samples:

Method: SW846 8260B

JB37127-3MS

6.1.3
6

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.12	ug/kg	
107-06-2	1,2-Dichloroethane	ND	1.0	0.14	ug/kg	
100-41-4	Ethylbenzene	ND	1.0	0.26	ug/kg	
98-82-8	Isopropylbenzene	ND	5.0	0.074	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.24	ug/kg	
108-88-3	Toluene	ND	1.0	0.11	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.21	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.16	ug/kg	
1330-20-7	Xylene (total)	ND	1.0	0.14	ug/kg	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	102%
17060-07-0	1,2-Dichloroethane-D4	89%
2037-26-5	Toluene-D8	108%
460-00-4	4-Bromofluorobenzene	96%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	ug/kg	

Blank Spike Summary

Job Number: JB37147

Account: AQTAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VY5787-BS	Y134375.D	1	05/18/13	RS	n/a	n/a	VY5787

The QC reported here applies to the following samples:

Method: SW846 8260B

JB37147-1, JB37147-2, JB37147-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	50	50.3	101	76-117
107-06-2	1,2-Dichloroethane	50	64.3	129	68-134
100-41-4	Ethylbenzene	50	48.5	97	74-119
98-82-8	Isopropylbenzene	50	54.0	108	71-119
1634-04-4	Methyl Tert Butyl Ether	50	57.5	115	72-124
108-88-3	Toluene	50	47.4	95	77-121
95-63-6	1,2,4-Trimethylbenzene	50	54.7	109	72-118
108-67-8	1,3,5-Trimethylbenzene	50	55.1	110	69-118
1330-20-7	Xylene (total)	150	141	94	76-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	104%	70-130%
17060-07-0	1,2-Dichloroethane-D4	95%	70-122%
2037-26-5	Toluene-D8	102%	81-127%
460-00-4	4-Bromofluorobenzene	102%	66-132%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: JB37147

Account: AQTAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VY5790-BS	Y134447.D	1	05/21/13	RS	n/a	n/a	VY5790

The QC reported here applies to the following samples:

Method: SW846 8260B

JB37147-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	50	52.7	105	76-117
107-06-2	1,2-Dichloroethane	50	60.0	120	68-134
100-41-4	Ethylbenzene	50	50.5	101	74-119
98-82-8	Isopropylbenzene	50	54.2	108	71-119
1634-04-4	Methyl Tert Butyl Ether	50	58.1	116	72-124
108-88-3	Toluene	50	50.9	102	77-121
95-63-6	1,2,4-Trimethylbenzene	50	51.9	104	72-118
108-67-8	1,3,5-Trimethylbenzene	50	53.4	107	69-118
1330-20-7	Xylene (total)	150	143	95	76-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	105%	70-130%
17060-07-0	1,2-Dichloroethane-D4	97%	70-122%
2037-26-5	Toluene-D8	110%	81-127%
460-00-4	4-Bromofluorobenzene	100%	66-132%

* = Outside of Control Limits.

Matrix Spike Summary

Page 1 of 1

Job Number: JB37147

Account: AQTAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JB37127-3MS	Y134497.D	1	05/22/13	RS	n/a	n/a	VY5790
JB37127-3	Y134466.D	1	05/21/13	RS	n/a	n/a	VY5790

The QC reported here applies to the following samples:

Method: SW846 8260B

JB37147-4

CAS No.	Compound	JB37127-3		Spike	MS	MS	Limits
		ug/kg	Q	ug/kg	ug/kg	%	
71-43-2	Benzene	ND		52.9	23.9	45* a	47-130
107-06-2	1,2-Dichloroethane	ND		52.9	36.0	68	46-135
100-41-4	Ethylbenzene	ND		52.9	47.6	90	30-139
98-82-8	Isopropylbenzene	ND		52.9	29.4	56	30-140
1634-04-4	Methyl Tert Butyl Ether	ND		105.8	86.1	82	50-127
108-88-3	Toluene	ND		52.9	24.5	46	38-136
95-63-6	1,2,4-Trimethylbenzene	ND		52.9	300	567* a	20-145
108-67-8	1,3,5-Trimethylbenzene	ND		52.9	99.2	188* a	24-142
1330-20-7	Xylene (total)	0.54	J	159	260	164* a	31-140

CAS No.	Surrogate Recoveries	MS	JB37127-3	Limits
1868-53-7	Dibromofluoromethane	101%	103%	65-131%
17060-07-0	1,2-Dichloroethane-D4	91%	95%	70-121%
2037-26-5	Toluene-D8	109%	110%	80-128%
460-00-4	4-Bromofluorobenzene	98%	102%	67-131%

(a) Outside control limits due to matrix interference.

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JB37147

Account: AQTAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JB37162-2MS	Y134376.D	1	05/19/13	RS	n/a	n/a	VY5787
JB37162-2MSD	Y134377.D	1	05/19/13	RS	n/a	n/a	VY5787
JB37162-2	Y134378.D	1	05/19/13	RS	n/a	n/a	VY5787

The QC reported here applies to the following samples:

Method: SW846 8260B

JB37147-1, JB37147-2, JB37147-3

CAS No.	Compound	JB37162-2		Spike	MS	MS	MSD	MSD	Limits	
		ug/kg	Q	ug/kg	ug/kg	%	ug/kg	%	RPD	Rec/RPD
71-43-2	Benzene	ND		64.5	47.9	74	35.0	58	31* a	47-130/22
107-06-2	1,2-Dichloroethane	ND		64.5	62.1	96	52.4	86	17	46-135/21
100-41-4	Ethylbenzene	ND		64.5	48.8	76	35.9	59	30* a	30-139/25
98-82-8	Isopropylbenzene	ND		64.5	54.7	85	40.4	67	30* a	30-140/27
1634-04-4	Methyl Tert Butyl Ether	ND		129	111	86	101	83	9	50-127/21
108-88-3	Toluene	ND		64.5	46.2	72	33.0	54	33* a	38-136/24
95-63-6	1,2,4-Trimethylbenzene	ND		64.5	54.3	84	37.9	63	36* a	20-145/28
108-67-8	1,3,5-Trimethylbenzene	ND		64.5	55.5	86	39.2	65	34* a	24-142/28
1330-20-7	Xylene (total)	ND		194	142	73	103	57	32* a	31-140/26

CAS No.	Surrogate Recoveries	MS	MSD	JB37162-2	Limits
1868-53-7	Dibromofluoromethane	102%	104%	103%	65-131%
17060-07-0	1,2-Dichloroethane-D4	95%	95%	93%	70-121%
2037-26-5	Toluene-D8	103%	103%	103%	80-128%
460-00-4	4-Bromofluorobenzene	102%	104%	107%	67-131%

(a) Outside control limits due to matrix interference.

* = Outside of Control Limits.

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Duplicate Summary

Job Number: JB37147

Account: AQTAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JB37342-2DUP	Y134461.D	1	05/21/13	RS	n/a	n/a	VY5790
JB37342-2	Y134460.D	1	05/21/13	RS	n/a	n/a	VY5790

The QC reported here applies to the following samples:

Method: SW846 8260B

JB37147-4

CAS No.	Compound	JB37342-2		DUP		RPD	Limits
		ug/kg	Q	ug/kg	Q		
71-43-2	Benzene	4.8		12.8		91* a	20
107-06-2	1,2-Dichloroethane	ND		ND		nc	10
100-41-4	Ethylbenzene	0.42	J	0.75	J	56* a	19
98-82-8	Isopropylbenzene	ND		ND		nc	15
1634-04-4	Methyl Tert Butyl Ether	29.4		67.2		78* a	16
108-88-3	Toluene	0.98		2.2		77* a	24
95-63-6	1,2,4-Trimethylbenzene	ND		ND		nc	10
108-67-8	1,3,5-Trimethylbenzene	ND		ND		nc	10
1330-20-7	Xylene (total)	1.6		3.0		61* a	24

CAS No.	Surrogate Recoveries	DUP	JB37342-2	Limits
1868-53-7	Dibromofluoromethane	105%	105%	65-131%
17060-07-0	1,2-Dichloroethane-D4	101%	100%	70-121%
2037-26-5	Toluene-D8	108%	108%	80-128%
460-00-4	4-Bromofluorobenzene	102%	103%	67-131%

(a) Outside control limits.

* = Outside of Control Limits.

Instrument Performance Check (BFB)

Page 1 of 1

Job Number: JB37147

Account: AQTPAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample:	VY5710-BFB	Injection Date:	04/02/13
Lab File ID:	Y132600.D	Injection Time:	09:38
Instrument ID:	GCMSY		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	7188	16.6	Pass
75	30.0 - 60.0% of mass 95	19216	44.2	Pass
95	Base peak, 100% relative abundance	43429	100.0	Pass
96	5.0 - 9.0% of mass 95	2887	6.65	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	41152	94.8	Pass
175	5.0 - 9.0% of mass 174	3182	7.33	(7.73) ^a Pass
176	95.0 - 101.0% of mass 174	39698	91.4	(96.5) ^a Pass
177	5.0 - 9.0% of mass 176	2683	6.18	(6.76) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VY5710-IC5710	Y132601.D	04/02/13	10:15	00:37	Initial cal 10
VY5710-IC5710	Y132602.D	04/02/13	10:44	01:06	Initial cal 5
VY5710-IC5710	Y132603.D	04/02/13	11:13	01:35	Initial cal 2
VY5710-IC5710	Y132604.D	04/02/13	11:42	02:04	Initial cal 1
VY5710-IC5710	Y132605.D	04/02/13	12:11	02:33	Initial cal 0.5
VY5710-IC5710	Y132606.D	04/02/13	12:40	03:02	Initial cal 20
VY5710-ICC5710	Y132607.D	04/02/13	13:09	03:31	Initial cal 50
VY5710-IC5710	Y132608.D	04/02/13	13:38	04:00	Initial cal 75
VY5710-IC5710	Y132609.D	04/02/13	14:07	04:29	Initial cal 100
VY5710-IC5710	Y132610.D	04/02/13	14:36	04:58	Initial cal 200
VY5710-ICV5710	Y132613.D	04/02/13	16:39	07:01	Initial cal verification 50
VY5710-ICV5710	Y132614.D	04/02/13	17:21	07:43	Initial cal verification 50

Instrument Performance Check (BFB)

Page 1 of 1

Job Number: JB37147

Account: AQTPAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample:	VY5787-BFB	Injection Date:	05/18/13
Lab File ID:	Y134371.D	Injection Time:	21:49
Instrument ID:	GCMSY		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	3467	16.7	Pass
75	30.0 - 60.0% of mass 95	10029	48.3	Pass
95	Base peak, 100% relative abundance	20754	100.0	Pass
96	5.0 - 9.0% of mass 95	1429	6.89	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	19608	94.5	Pass
175	5.0 - 9.0% of mass 174	1581	7.62	(8.06) ^a Pass
176	95.0 - 101.0% of mass 174	19088	92.0	(97.3) ^a Pass
177	5.0 - 9.0% of mass 176	1326	6.39	(6.95) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VY5787-CC5710	Y134372.D	05/18/13	22:18	00:29	Continuing cal 50
VY5787-MB	Y134374.D	05/18/13	23:15	01:26	Method Blank
VY5787-BS	Y134375.D	05/18/13	23:44	01:55	Blank Spike
JB37162-2MS	Y134376.D	05/19/13	00:12	02:23	Matrix Spike
JB37162-2MSD	Y134377.D	05/19/13	00:41	02:52	Matrix Spike Duplicate
JB37162-2	Y134378.D	05/19/13	01:10	03:21	(used for QC only; not part of job JB37147)
ZZZZZZ	Y134379.D	05/19/13	01:39	03:50	(unrelated sample)
ZZZZZZ	Y134380.D	05/19/13	02:07	04:18	(unrelated sample)
ZZZZZZ	Y134381.D	05/19/13	02:37	04:48	(unrelated sample)
ZZZZZZ	Y134382.D	05/19/13	03:05	05:16	(unrelated sample)
ZZZZZZ	Y134383.D	05/19/13	03:34	05:45	(unrelated sample)
ZZZZZZ	Y134385.D	05/19/13	04:32	06:43	(unrelated sample)
ZZZZZZ	Y134386.D	05/19/13	05:01	07:12	(unrelated sample)
ZZZZZZ	Y134387.D	05/19/13	05:29	07:40	(unrelated sample)
ZZZZZZ	Y134388.D	05/19/13	05:58	08:09	(unrelated sample)
ZZZZZZ	Y134390.D	05/19/13	06:55	09:06	(unrelated sample)
ZZZZZZ	Y134391.D	05/19/13	07:24	09:35	(unrelated sample)
JB37147-1	Y134392.D	05/19/13	07:52	10:03	AOI-5_MW-441_8-10'_51513
JB37147-2	Y134393.D	05/19/13	08:21	10:32	AOI-5_MW-441_0-2'_51513
JB37147-3	Y134394.D	05/19/13	08:49	11:00	AOI-5_MW-449_2-2'_51513

Instrument Performance Check (BFB)

Page 1 of 1

Job Number: JB37147

Account: AQTPAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample:	VY5790-BFB	Injection Date:	05/21/13
Lab File ID:	Y134444.D	Injection Time:	10:59
Instrument ID:	GCMSY		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	4497	16.1	Pass
75	30.0 - 60.0% of mass 95	12430	44.6	Pass
95	Base peak, 100% relative abundance	27869	100.0	Pass
96	5.0 - 9.0% of mass 95	1754	6.29	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	27696	99.4	Pass
175	5.0 - 9.0% of mass 174	2290	8.22	(8.27) ^a Pass
176	95.0 - 101.0% of mass 174	27053	97.1	(97.7) ^a Pass
177	5.0 - 9.0% of mass 176	1809	6.49	(6.69) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VY5790-CC5710	Y134445.D	05/21/13	11:51	00:52	Continuing cal 20
VY5790-MB	Y134446.D	05/21/13	12:31	01:32	Method Blank
VY5790-BS	Y134447.D	05/21/13	13:12	02:13	Blank Spike
ZZZZZZ	Y134448.D	05/21/13	13:55	02:56	(unrelated sample)
ZZZZZZ	Y134449.D	05/21/13	14:39	03:40	(unrelated sample)
ZZZZZZ	Y134450.D	05/21/13	15:08	04:09	(unrelated sample)
ZZZZZZ	Y134451.D	05/21/13	15:36	04:37	(unrelated sample)
ZZZZZZ	Y134452.D	05/21/13	16:06	05:07	(unrelated sample)
ZZZZZZ	Y134453.D	05/21/13	16:34	05:35	(unrelated sample)
ZZZZZZ	Y134454.D	05/21/13	17:04	06:05	(unrelated sample)
ZZZZZZ	Y134455.D	05/21/13	17:32	06:33	(unrelated sample)
ZZZZZZ	Y134456.D	05/21/13	18:01	07:02	(unrelated sample)
ZZZZZZ	Y134457.D	05/21/13	18:30	07:31	(unrelated sample)
JB37147-4	Y134458.D	05/21/13	18:59	08:00	AOI-5_MW-445_3-3.5'_51513
JB37342-2	Y134460.D	05/21/13	19:57	08:58	(used for QC only; not part of job JB37147)
JB37342-2DUP	Y134461.D	05/21/13	20:26	09:27	Duplicate
ZZZZZZ	Y134463.D	05/21/13	21:23	10:24	(unrelated sample)
ZZZZZZ	Y134464.D	05/21/13	21:52	10:53	(unrelated sample)
ZZZZZZ	Y134465.D	05/21/13	22:21	11:22	(unrelated sample)
JB37127-3	Y134466.D	05/21/13	22:50	11:51	(used for QC only; not part of job JB37147)

Instrument Performance Check (BFB)

Job Number: JB37147

Account: AQTPAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample:	VY5790-BFB	Injection Date:	05/22/13
Lab File ID:	Y134493.D	Injection Time:	15:15
Instrument ID:	GCMSY		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	4471	16.2	Pass
75	30.0 - 60.0% of mass 95	12002	43.5	Pass
95	Base peak, 100% relative abundance	27586	100.0	Pass
96	5.0 - 9.0% of mass 95	1842	6.68	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	27349	99.1	Pass
175	5.0 - 9.0% of mass 174	2288	8.29	(8.37) ^a Pass
176	95.0 - 101.0% of mass 174	27157	98.4	(99.3) ^a Pass
177	5.0 - 9.0% of mass 176	1852	6.71	(6.82) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VY5790-CC5710	Y134494.D	05/22/13	16:06	00:51	Continuing cal 20
VY5790-MB2	Y134495.D	05/22/13	17:06	01:51	Method Blank
VY5790-BS2	Y134496.D	05/22/13	17:39	02:24	Blank Spike
JB37127-3MS	Y134497.D	05/22/13	18:13	02:58	Matrix Spike
VY5792-MB	Y134499.D	05/22/13	19:10	03:55	Method Blank
VY5792-BS	Y134500.D	05/22/13	19:39	04:24	Blank Spike
JB37573-1MS	Y134501.D	05/22/13	20:08	04:53	Matrix Spike
JB37573-1MSD	Y134502.D	05/22/13	20:37	05:22	Matrix Spike Duplicate
ZZZZZZ	Y134504.D	05/22/13	21:35	06:20	(unrelated sample)
JB37573-1	Y134505.D	05/22/13	22:04	06:49	(used for QC only; not part of job JB37147)
ZZZZZZ	Y134506.D	05/22/13	22:33	07:18	(unrelated sample)
ZZZZZZ	Y134507.D	05/22/13	23:01	07:46	(unrelated sample)
ZZZZZZ	Y134508.D	05/22/13	23:30	08:15	(unrelated sample)
ZZZZZZ	Y134509.D	05/22/13	23:59	08:44	(unrelated sample)
ZZZZZZ	Y134510.D	05/23/13	00:28	09:13	(unrelated sample)
ZZZZZZ	Y134511.D	05/23/13	00:56	09:41	(unrelated sample)
ZZZZZZ	Y134512.D	05/23/13	01:25	10:10	(unrelated sample)
ZZZZZZ	Y134514.D	05/23/13	02:22	11:07	(unrelated sample)
ZZZZZZ	Y134515.D	05/23/13	02:51	11:36	(unrelated sample)

Volatile Internal Standard Area Summary

Page 1 of 1

Job Number: JB37147

Account: AQTPAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	VY5787-CC5710	Injection Date:	05/18/13
Lab File ID:	Y134372.D	Injection Time:	22:18
Instrument ID:	GCMSY	Method:	SW846 8260B

	IS 1 AREA	IS 2 AREA	IS 3 AREA	IS 4 AREA	IS 5 AREA	
Check Std	27830	7.63	85170	9.82	117623	10.73 90602 13.82 46959 16.10
Upper Limit ^a	55660	8.13	170340	10.32	235246	11.23 181204 14.32 93918 16.60
Lower Limit ^b	13915	7.13	42585	9.32	58812	10.23 45301 13.32 23480 15.60

Lab Sample ID	IS 1 AREA	IS 2 AREA	IS 3 AREA	IS 4 AREA	IS 5 AREA	
VY5787-MB	33220	7.64	98275	9.81	133875	10.73 101740 13.82 48911 16.10
VY5787-BS	30968	7.64	89094	9.82	123466	10.73 95743 13.82 49229 16.10
JB37162-2MS	36370	7.63	94671	9.82	129371	10.73 100022 13.82 52223 16.10
JB37162-2MSD	35904	7.64	94295	9.82	130542	10.73 102052 13.82 51357 16.10
JB37162-2	27391	7.64	91037	9.82	125936	10.73 98091 13.82 47507 16.10
ZZZZZZ	29024	7.64	98945	9.82	133871	10.73 103522 13.82 49310 16.10
ZZZZZZ	29143	7.64	91500	9.82	124761	10.73 89951 13.82 39364 16.10
ZZZZZZ	29764	7.64	94276	9.82	128963	10.73 98732 13.82 47232 16.10
ZZZZZZ	30633	7.64	94471	9.82	129964	10.73 99278 13.82 50242 16.10
ZZZZZZ	29794	7.64	96113	9.81	130446	10.73 98964 13.82 42844 16.10
ZZZZZZ	36934	7.63	109609	9.82	150212	10.73 117752 13.82 57666 16.10
ZZZZZZ	30516	7.64	100667	9.82	137432	10.73 107028 13.82 52409 16.10
ZZZZZZ	33220	7.64	109395	9.82	148973	10.73 113525 13.82 55611 16.10
ZZZZZZ	36422	7.64	107638	9.81	146945	10.73 113297 13.82 58370 16.10
ZZZZZZ	23803	7.64	96051	9.82	131288	10.73 94823 13.82 40132 16.10
ZZZZZZ	31224	7.64	104969	9.82	144659	10.73 109450 13.82 53704 16.10
JB37147-1	34051	7.64	108607	9.82	147448	10.73 116739 13.82 58503 16.10
JB37147-2	37717	7.64	107498	9.82	143676	10.73 112840 13.82 55201 16.10
JB37147-3	31334	7.63	104691	9.82	142870	10.73 112735 13.82 55697 16.10

IS 1 = Tert Butyl Alcohol-D9

IS 2 = Pentafluorobenzene

IS 3 = 1,4-Difluorobenzene

IS 4 = Chlorobenzene-D5

IS 5 = 1,4-Dichlorobenzene-d4

(a) Upper Limit = + 100% of check standard area; Retention time + 0.5 minutes.

(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

6.7.1
6

Volatile Internal Standard Area Summary

Page 1 of 1

Job Number: JB37147

Account: AQTPAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	VY5790-CC5710	Injection Date:	05/21/13
Lab File ID:	Y134445.D	Injection Time:	11:51
Instrument ID:	GCMSY	Method:	SW846 8260B

	IS 1 AREA	IS 2 RT	IS 2 AREA	IS 3 RT	IS 3 AREA	IS 4 RT	IS 4 AREA	IS 5 RT	IS 5 AREA	IS 5 RT
Lab Sample ID	IS 1 AREA	IS 2 RT	IS 2 AREA	IS 3 RT	IS 3 AREA	IS 4 RT	IS 4 AREA	IS 5 RT	IS 5 AREA	IS 5 RT
VY5790-MB	41674	7.64	105547	9.81	145367	10.73	114783	13.82	58885	16.10
VY5790-BS	43341	7.63	99890	9.81	140290	10.73	113928	13.82	60896	16.10
ZZZZZZ	39833	7.63	110004	9.81	153641	10.73	122913	13.82	60817	16.10
ZZZZZZ	49273	7.63	106472	9.81	147125	10.73	114265	13.82	56017	16.10
ZZZZZZ	40899	7.64	108421	9.82	149419	10.73	118849	13.82	59664	16.10
ZZZZZZ	38007	7.64	93820	9.82	131303	10.73	97351	13.82	42651	16.10
ZZZZZZ	34730	7.65	92421	9.82	127240	10.73	93053	13.82	35963	16.10
ZZZZZZ	39388	7.64	93013	9.82	131738	10.73	107215	13.82	54599	16.10
ZZZZZZ	35984	7.64	91358	9.82	129148	10.73	103643	13.82	53003	16.10
ZZZZZZ	40693	7.64	98976	9.82	139699	10.73	111382	13.82	56808	16.10
ZZZZZZ	40832	7.63	94679	9.82	132550	10.73	99025	13.82	45052	16.10
ZZZZZZ	41175	7.64	93398	9.82	131075	10.73	98225	13.82	43720	16.10
JB37147-4	38144	7.64	95341	9.82	134902	10.73	108020	13.82	56254	16.10
JB37342-2	45359	7.64	101736	9.82	141452	10.73	113491	13.82	58821	16.10
JB37342-2DUP	43909	7.64	103693	9.82	145787	10.73	115397	13.82	60198	16.10
ZZZZZZ	42825	7.64	109497	9.81	149418	10.73	120534	13.82	61760	16.10
ZZZZZZ	43978	7.64	111675	9.81	150780	10.73	117473	13.82	62012	16.10
ZZZZZZ	41460	7.64	109014	9.82	149696	10.73	119102	13.82	60402	16.10
JB37127-3	43051	7.64	107102	9.82	148133	10.73	119844	13.82	60906	16.10

IS 1 = Tert Butyl Alcohol-D9

IS 2 = Pentafluorobenzene

IS 3 = 1,4-Difluorobenzene

IS 4 = Chlorobenzene-D5

IS 5 = 1,4-Dichlorobenzene-d4

(a) Upper Limit = + 100% of check standard area; Retention time + 0.5 minutes.

(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

Volatile Internal Standard Area Summary

Page 1 of 1

Job Number: JB37147

Account: AQTPAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	VY5790-CC5710	Injection Date:	05/22/13
Lab File ID:	Y134494.D	Injection Time:	16:06
Instrument ID:	GCMSY	Method:	SW846 8260B

	IS 1 AREA	IS 2 AREA	IS 3 AREA	IS 4 AREA	IS 5 AREA	
Lab Sample ID	IS 1 AREA	IS 2 AREA	IS 3 AREA	IS 4 AREA	IS 5 AREA	RT
Check Std	45425	7.64	102310	9.81	142633	10.73
Upper Limit ^a	90850	8.14	204620	10.31	285266	11.23
Lower Limit ^b	22713	7.14	51155	9.31	71317	10.23
VY5790-MB2	42191	7.64	106530	9.81	148812	10.73
VY5790-BS2	47714	7.64	105605	9.81	147386	10.73
JB37127-3MS	48994	7.64	110228	9.81	152222	10.73
VY5792-MB	41730	7.64	108147	9.82	150520	10.73
VY5792-BS	36433	7.64	106194	9.82	146455	10.73
JB37573-1MS	43576	7.64	111815	9.82	154008	10.73
JB37573-1MSD	43613	7.64	105851	9.81	145092	10.73
ZZZZZZ	41952	7.64	111002	9.81	153323	10.73
JB37573-1	41660	7.64	105657	9.81	147758	10.73
ZZZZZZ	40397	7.65	103101	9.82	144874	10.73
ZZZZZZ	38901	7.64	101648	9.82	141549	10.73
ZZZZZZ	39984	7.64	102284	9.82	143451	10.73
ZZZZZZ	40792	7.64	105518	9.81	147287	10.73
ZZZZZZ	39366	7.63	101897	9.82	141837	10.73
ZZZZZZ	39036	7.64	99243	9.82	139134	10.73
ZZZZZZ	41424	7.64	108920	9.82	150413	10.73
ZZZZZZ	39246	7.64	97098	9.82	133691	10.73
ZZZZZZ	36393	7.64	97110	9.82	137193	10.73

IS 1 = Tert Butyl Alcohol-D9

IS 2 = Pentafluorobenzene

IS 3 = 1,4-Difluorobenzene

IS 4 = Chlorobenzene-D5

IS 5 = 1,4-Dichlorobenzene-d4

(a) Upper Limit = + 100% of check standard area; Retention time + 0.5 minutes.

(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

Volatile Surrogate Recovery Summary

Page 1 of 1

Job Number: JB37147

Account: AQTAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Method: SW846 8260B

Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4
JB37147-1	Y134392.D	101.0	90.0	104.0	104.0
JB37147-2	Y134393.D	82.0	88.0	103.0	104.0
JB37147-3	Y134394.D	103.0	90.0	103.0	105.0
JB37147-4	Y134458.D	108.0	106.0	108.0	107.0
JB37127-3MS	Y134497.D	101.0	91.0	109.0	98.0
JB37162-2MS	Y134376.D	102.0	95.0	103.0	102.0
JB37162-2MSD	Y134377.D	104.0	95.0	103.0	104.0
JB37342-2DUP	Y134461.D	105.0	101.0	108.0	102.0
VY5787-BS	Y134375.D	104.0	95.0	102.0	102.0
VY5787-MB	Y134374.D	99.0	89.0	102.0	106.0
VY5790-BS	Y134447.D	105.0	97.0	110.0	100.0
VY5790-MB	Y134446.D	101.0	92.0	108.0	101.0
VY5790-MB2	Y134495.D	102.0	89.0	108.0	96.0

Surrogate
Compounds

Recovery
Limits

S1 = Dibromofluoromethane 70-130%
S2 = 1,2-Dichloroethane-D4 70-122%
S3 = Toluene-D8 81-127%
S4 = 4-Bromofluorobenzene 66-132%

6.8.1
6

Initial Calibration Summary

Page 1 of 5

Job Number: JB37147

Sample: VY5710-ICC5710

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: Y132607.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Response Factor Report MSY

Method : C:\MSDCHEM\1\METHODS\MY5710.M (RTE Integrator)

Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um

Last Update : Thu Apr 04 09:48:17 2013

Response via : Initial Calibration

Calibration Files

5	=Y132602.D	10	=Y132601.D	0.5	=Y132605.D	50	=Y132607.D
100	=Y132609.D	1	=Y132604.D	200	=Y132610.D	20	=Y132606.D
2	=Y132603.D	75	=Y132608.D	=			

Compound

	5	10	0.5	50	100	1	200	20	2	75	Avg	%RSD
--	---	----	-----	----	-----	---	-----	----	---	----	-----	------

1)	I	Tert Butyl Alcohol-d9	-----	ISTD-----								
2)	1,4-dioxane		0.102 0.102	0.106 0.105 0.070 0.103 0.108 0.091 0.105 0.099	12.10							
3)	tertiary butyl alcohol		1.334 1.205	1.214 1.206 1.513 1.140 1.236 1.357 1.178 1.265	9.21							
4)	I	pentafluorobenzene	-----	ISTD-----								
5)	propene										0.000	-1.00
6)	freon 141b		0.317 0.333	0.288 0.259 0.326 0.232 0.316 0.341 0.301 0.301	12.03							
7)	freon 142b		0.378 0.392	0.326 0.342 0.367 0.278 0.373 0.378 0.337 0.352	10.10							
8)	freon 143a		0.267 0.280	0.219 0.223 0.286 0.258 0.238 0.216 0.248	11.33							
9)	chlorodifluoromethane		0.412 0.398 0.333 0.333	0.353 0.429 0.311 0.369 0.357 0.341 0.364	10.52							
10)	dichlorodifluoromethane		0.496 0.507	0.394 0.430 0.436 0.369 0.448 0.511 0.406 0.444	11.52							
11)	chloromethane		0.494 0.492	0.449 0.447 0.400 0.473 0.449 0.458	7.11							
12)	vinyl chloride		0.555 0.568 0.528	0.464 0.480 0.610 0.428 0.520 0.589 0.470 0.521	11.48							
13)	bromomethane		0.334 0.337	0.289 0.285 0.233 0.306 0.360 0.282 0.303	13.18							
14)	chloroethane		0.255 0.257	0.218 0.222 0.274 0.191 0.241 0.265 0.218 0.238	11.42							
15)	Vinyl Bromide										0.000	-1.00
16)	trichlorofluoromethane		0.553 0.572	0.450 0.486 0.549 0.419 0.518 0.618 0.466 0.515	12.51							
17)	ethyl ether		0.236 0.231	0.224 0.234 0.208 0.219 0.225 0.225	4.31							
18)	2-chloropropane		0.138 0.161	0.130 0.135 0.123 0.148 0.159 0.133 0.141	9.79							
19)	acrolein		0.063 0.065	0.063 0.065 0.075 0.060 0.063 0.063 0.065	6.90							
20)	1,1-dichloroethene		0.561 0.590	0.471 0.469 0.423 0.539 0.478 0.504	11.82							
21)	acetone		0.027	0.027 0.030 0.027 0.034 0.029 0.029	8.57							
22)	allyl chloride		0.221 0.225	0.210 0.216 0.224 0.195 0.219 0.237 0.211 0.218	5.40							
23)	acetonitrile											

6.9.1
6

Initial Calibration Summary

Page 3 of 5

Job Number: JB37147

Sample: VY5710-ICC5710

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: Y132607.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

52)	Cyclohexane	0.540	0.573	0.436	0.468	0.413	0.513	0.449	0.485	12.15			
53)	2,2,4-trimethylpentane	1.392	1.320	1.328	1.070	1.172	1.495	1.016	1.174	1.281	1.119	1.237	12.25
54)	tert-amyl methyl ether	1.266	1.184	1.521	1.220	1.291	1.600	1.164	1.180	1.352	1.238	1.302	11.44
55)	I 1,4-difluorobenzene												
56)	epichlorohydrin	0.023	0.022	0.023	0.025	0.023	0.023	0.023	0.023	0.023	3.91		
57)	n-butyl alcohol	0.008	0.008	0.008	0.009	0.008	0.008	0.008	0.008	0.008	4.78		
58)	carbon tetrachloride	0.350	0.378	0.281	0.300	0.317	0.408	0.285	0.348	0.410	0.306	0.338	14.31
59)	1,1-dichloropropene	0.354	0.374	0.310	0.303	0.314	0.378	0.286	0.347	0.412	0.306	0.338	12.06
60)	hexane	0.347	0.325	0.251	0.272	0.234	0.287	0.258	0.282	0.282	14.46		
61)	Tert Amyl Alcohol	0.034	0.033	0.031	0.033	0.040	0.030	0.030	0.032	0.031	0.033	9.45	
62)	benzene	1.117	1.167	1.175	1.031	1.067	1.366	0.971	1.103	1.366	1.045	1.141	11.70
63)	heptane	0.193	0.183	0.201	0.146	0.158	0.202	0.136	0.162	0.192	0.150	0.172	14.32
64)	isopropyl acetate	0.100	0.101	0.105	0.112	0.101	0.108	0.092	0.105	0.103	0.103	5.72	
65)	1,2-dichloroethane	0.318	0.336	0.249	0.327	0.344	0.386	0.311	0.321	0.384	0.328	0.330	11.68
66)	trichloroethene	0.274	0.281	0.246	0.244	0.254	0.315	0.231	0.270	0.322	0.250	0.268	11.33
67)	ethyl acrylate	0.283	0.294	0.308	0.335	0.251	0.310	0.280	0.250	0.317	0.292	0.292	9.95
68)	2-nitropropane	0.089	0.084	0.081	0.086	0.074	0.079	0.108	0.079	0.085	0.085	12.25	
69)	2-chloroethyl vinyl ether	0.114	0.111	0.121	0.131	0.128	0.121	0.117	0.115	0.123	0.120	0.120	5.45
70)	methyl methacrylate	0.165	0.173	0.170	0.184	0.166	0.161	0.192	0.171	0.173	0.173	6.01	
71)	1,2-dichloropropane	0.287	0.285	0.285	0.278	0.288	0.355	0.261	0.277	0.357	0.279	0.295	11.18
72)	methylcyclohexane	0.407	0.397	0.427	0.316	0.341	0.427	0.295	0.352	0.380	0.328	0.367	12.90
73)	Tert-amyl ethyl ether	0.721	0.704	0.731	0.692	0.730	0.766	0.665	0.694	0.698	0.710	0.711	3.87
74)	dibromomethane	0.159	0.165	0.165	0.173	0.193	0.157	0.162	0.204	0.166	0.172	0.172	9.44
75)	bromodichloromethane	0.371	0.379	0.395	0.367	0.389	0.449	0.355	0.368	0.455	0.373	0.390	8.86
76)	cis-1,3-dichloropropene	0.464	0.468	0.482	0.454	0.475	0.566	0.433	0.447	0.552	0.462	0.480	9.14
77)	toluene-d8 (s)	0.976	1.004	0.875	0.903	0.812	0.932	0.893	0.914	0.914	0.914	7.04	
78)	4-methyl-2-pentanone	0.096	0.099	0.098	0.107	0.095	0.092	0.108	0.098	0.099	0.099	5.75	
79)	toluene	1.159	1.192	1.039	1.081	1.471	0.980	1.110	1.407	1.056	1.166	14.36	
80)	3-methyl-1-butanol	0.008	0.007	0.007	0.008	0.011	0.007	0.007	0.008	0.007	0.008	13.57	
81)	trans-1,3-dichloropropene	0.382	0.404	0.351	0.399	0.423	0.479	0.383	0.383	0.447	0.400	0.405	9.06

6.9
6

Initial Calibration Summary

Page 4 of 5

Job Number: JB37147

Sample: VY5710-ICC5710

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: Y132607.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

82)	ethyl methacrylate	0.328	0.342	0.337	0.359	0.439	0.323	0.320	0.388	0.331	0.352	11.09
83)	1,1,2-trichloroethane	0.194	0.198	0.211	0.197	0.208	0.271	0.189	0.188	0.247	0.196	0.210
84)	2-hexanone	0.085	0.095		0.097	0.107		0.096	0.092	0.083	0.096	0.094
85)	I chlorobenzene-d5											
86)	tetrachloroethene	0.375	0.398	0.412	0.316	0.331	0.430	0.297	0.364	0.453	0.324	0.370
87)	1,3-dichloropropane	0.459	0.466	0.510	0.453	0.477	0.561	0.429	0.443	0.558	0.455	0.481
88)	butyl acetate	0.204	0.193		0.189	0.210		0.189	0.194	0.186	0.195	0.195
89)	dibromochloromethane	0.350	0.357	0.360	0.358	0.384	0.445	0.348	0.343	0.415	0.362	0.372
90)	1,2-dibromoethane	0.283	0.297	0.249	0.292	0.309	0.341	0.279	0.283	0.330	0.293	0.296
91)	3,3-Dimethyl-1-Butanol	0.036	0.034		0.032	0.035		0.031	0.032	0.040	0.031	0.034
92)	chlorobenzene	0.907	0.937	1.114	0.867	0.894	1.229	0.802	0.893	1.143	0.864	0.965
93)	1,1,1,2-tetrachloroethane	0.325	0.357	0.375	0.337	0.347	0.426	0.315	0.338	0.423	0.337	0.358
94)	ethylbenzene	1.518	1.579		1.354	1.401	1.934	1.265	1.476	1.822	1.362	1.523
95)	m,p-xylene	0.587	0.614	0.741	0.526	0.544	0.742		0.570	0.696	0.531	0.617
96)	o-xylene	1.227	1.274		1.142	1.187	1.616	1.062	1.190	1.497	1.142	1.260
97)	styrene	0.982	1.011	1.043	0.959	1.000	1.271	0.892	0.963	1.206	0.958	1.029
98)	bromoform	0.232	0.237		0.248	0.266	0.302	0.243	0.229	0.270	0.247	0.253
99)	I 1,4-dichlorobenzene-d											
100)	isopropylbenzene	2.646	2.822		2.350	2.412		2.255	2.640		2.393	2.503
101)	4-bromofluorobenzene (s)	0.869		0.769	0.788		0.735	0.816		0.783	0.793	5.73
102)	bromobenzene	0.763	0.789	0.907	0.749	0.773	1.040	0.716	0.756	0.966	0.753	0.821
103)	cyclohexanone	0.094	0.110		0.059	0.071		0.103	0.107	0.073	0.088	23.00
		----- Quadratic regression -----										Coefficient = 0.9816
		Response Ratio = 0.06556 + 0.05829 *A + 0.00048 *A^2										
104)	1,1,2,2-tetrachloroethane	0.692	0.712		0.696	0.726		0.678	0.669	0.883	0.687	0.718
105)	trans-1,4-dichloro-2-butene	0.161	0.178		0.181	0.193		0.184	0.171	0.180	0.181	0.179
106)	1,2,3-trichloropropane	0.165	0.161		0.166	0.172		0.161	0.162	0.211	0.163	0.170
107)	n-propylbenzene	3.210	3.344		2.789	2.880		2.678	3.130		2.835	2.981
108)	4-Ethyltoluene	2.701	2.732	2.823	2.425	2.437	2.525	2.325	2.626	2.614	2.439	2.565
109)	2-chlorotoluene	0.668	0.708		0.625	0.635		0.584	0.649		0.629	0.642
110)	4-chlorotoluene											6.00

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Initial Calibration Summary

Page 5 of 5

Job Number: JB37147

Sample: VY5710-ICC5710

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: Y132607.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

111)	2.041 1,3,5-trimethylbenzene	2.116 2.296 2.451	1.900 1.984 2.122	1.935 1.779 2.019	1.779 1.870 2.181	2.019 2.106 2.144	1.906 2.106 2.144	1.957 2.144 8.96	5.69 8.96
112)	tert-butylbenzene	1.938 1.990	1.710 1.674 1.710		1.571 1.571 1.856		1.692 1.692 1.776		8.67 8.67
113)	pentachloroethane	0.488 0.514	0.501 0.496 0.501		0.465 0.465 0.496	0.616 0.616 0.492	0.492 0.492 0.509		8.99 8.99
114)	1,2,4-trimethylbenzene	2.334 2.428	2.190 2.142 2.190		1.977 1.977 2.291		2.151 2.151 2.216		6.69 6.69
115)	sec-butylbenzene	2.972 3.073	2.554 2.489 2.554		2.327 2.327 2.842		2.528 2.528 2.684		10.38 10.38
116)	1,3-dichlorobenzene	1.447 1.460	1.389 1.364 1.389		1.252 1.252 1.399	1.825 1.825 1.358	1.358 1.358 1.437		11.79 11.79
117)	p-isopropyltoluene	2.434 2.526	2.156 2.108 2.156		1.934 1.934 2.384		2.140 2.140 2.240		9.43 9.43
118)	1,4-dichlorobenzene	1.531 1.522	1.452 1.403 1.452		1.290 1.290 1.468		1.414 1.414 1.440		5.71 5.71
119)	1,2-dichlorobenzene	1.417 1.403	1.353 1.336 1.353		1.202 1.202 1.332	1.780 1.780 1.324	1.324 1.324 1.393		12.15 12.15
120)	n-butylbenzene	0.574 0.559	0.456 0.459 0.456		0.409 0.409 0.513		0.457 0.457 0.489		12.44 12.44
121)	p-Diethylbenzene	1.489 1.512	1.446 1.292 1.334	1.352 1.352 1.352	1.178 1.178 1.414	1.382 1.382 1.346	1.346 1.346 1.374		7.15 7.15
122)	1,2-dibromo-3-chloropropane	0.134 0.142	0.139 0.139 0.133		0.120 0.120 0.135	0.161 0.161 0.129	0.129 0.129 0.137		8.62 8.62
123)	1,3,5-Trichlorobenzene	1.215 1.220	1.024 1.067 1.024		0.872 0.872 1.165		1.036 1.036 1.086		11.49 11.49
124)	1,2,4-trichlorobenzene	1.071 1.089	0.900 0.987 0.900		0.738 0.738 1.019		0.914 0.914 0.960		12.64 12.64
125)	1,2,4,5-tetramethylbenzene	2.497 2.487	2.199 2.199 2.163	2.375 2.375 1.899	1.899 1.899 2.343	2.343 2.343 2.328	2.328 2.328 2.220	2.220 2.220 2.279	8.13 8.13
126)	hexachlorobutadiene	0.618 0.639	0.452 0.497 0.452		0.590 0.590		0.478 0.478 0.545		14.59 14.59
127)	naphthalene	2.149 2.146	1.741 1.970 1.741		1.451 1.451 2.004		1.757 1.757 1.888		13.41 13.41
128)	1,2,3-trichlorobenzene	0.974 0.965	0.725 0.865 0.725		0.914 0.914		0.751 0.751 0.866		12.34 12.34
129)	hexachloroethane	0.475 0.497	0.450 0.448 0.450	0.606 0.606 0.410	0.486 0.486 0.553	0.451 0.451 0.486			12.38 12.38
130)	Benzyl chloride	1.483 1.378	1.423 1.330 1.423		1.281 1.281 1.397	1.508 1.508 1.368	1.368 1.368 1.396		5.38 5.38

(#) = Out of Range ### Number of calibration levels exceeded format ###

MY5710.M

Thu Apr 04 14:19:53 2013

RPT1

6.9.1
6

Initial Calibration Verification

Job Number: JB37147

Account: AQTPAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: VY5710-ICV5710

Lab FileID: Y132613.D

Evaluate Continuing Calibration Report

Data File : C:\MSDChem\1\DATA\Y132613.D Vial: 14
 Acq On : 2 Apr 2013 4:39 pm Operator: ROBERTS
 Sample : ICV5710-50 Inst : MSY
 Misc : MS45471,VY5710,5.0,,,1 Multiplr: 1.00
 MS Integration Params: LSCINT.P

Method : C:\MSDCHEM\1\METHODS\MY5710.M (RTE Integrator)
 Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 Last Update : Thu Apr 04 09:48:17 2013
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)R.T.	
1	I Tert Butyl Alcohol-d9	1.000	1.000	0.0	115	0.00 7.64	
2	1,4-dioxane	0.099	0.109	-10.1	118	0.00 11.46	
3	tertiary butyl alcohol	1.265	1.222	3.4	115	0.00 7.75	
4	I pentafluorobenzene	1.000	1.000	0.0	100	0.00 9.81	
5	propene			-----NA-----			
6	freon 141b	0.301	0.297	1.3	104	0.00 6.51	
7	freon 142b	0.352	0.346	1.7	106	0.00 4.44	
8	freon 143a	0.248	0.230	7.3	105	0.00 3.83	
9	chlorodifluoromethane	0.364	0.297	18.4	89	0.00 4.18	
10	dichlorodifluoromethane	0.444	0.375	15.5	96	0.01 4.16	
11	chloromethane	0.458	0.446	2.6	99	0.00 4.52	
12	vinyl chloride	0.521	0.468	10.2	101	0.00 4.78	
13	bromomethane	0.303	0.287	5.3	100	0.00 5.46	
14	chloroethane	0.238	0.214	10.1	98	0.00 5.63	
15	Vinyl Bromide			-----NA-----			
16	trichlorofluoromethane	0.515	0.462	10.3	103	0.00 6.08	
17	ethyl ether	0.225	0.244	-8.4	109	0.00 6.48	
18	2-chloropropane	0.141	0.134	5.0	103	0.00 6.70	
19	acrolein	0.065	0.069	-6.2	109	0.00 6.80	
20	1,1-dichloroethene	0.504	0.486	3.6	103	0.00 6.93	
21	acetone	0.029	0.032	-10.3	117	0.00 7.02	
22	allyl chloride	0.218	0.214	1.8	102	0.00 7.46	
23	acetonitrile	0.017	0.021	-23.5#	120	0.00 7.51	
24	iodomethane	0.711	0.670	5.8	102	0.00 7.22	
25	iso-butyl alcohol	0.014	0.015	-7.1	113	0.00 10.14	
26	carbon disulfide	1.165	1.062	8.8	101	0.00 7.33	
27	1-chloropropane	0.027	0.026	3.7	100	0.00 7.68	
28	methylene chloride	0.566	0.558	1.4	104	-0.01 7.67	
29	methyl acetate	50.000	76.572	True -53.1#	Calc. 156	% Drift 0.00 7.45	
30	methyl tert butyl ether	1.155	1.174	-1.6	106	0.00 7.95	
31	trans-1,2-dichloroethene	0.516	0.479	7.2	100	0.00 8.02	
32	di-isopropyl ether	1.384	1.358	1.9	102	0.00 8.52	
33	ethyl tert-butyl ether	1.294	1.304	-0.8	103	0.00 8.98	
34	2-butanone	0.040	0.044	-10.0	111	0.00 9.32	
35	1,1-dichloroethane	0.687	0.657	4.4	102	0.00 8.59	
36	chloroprene	0.464	0.453	2.4	107	0.00 8.68	
37	acrylonitrile	0.122	0.130	-6.6	111	0.00 8.04	

Initial Calibration Verification

Job Number: JB37147

Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PASample: VY5710-ICV5710
Lab FileID: Y132613.D

38	vinyl acetate	0.058	0.027	53.4#	44#	0.00	8.58
39	ethyl acetate	0.049	0.052	-6.1	97	0.00	9.30
40	2,2-dichloropropane	0.528	0.475	10.0	101	0.00	9.32
41	cis-1,2-dichloroethene	0.454	0.426	6.2	101	0.00	9.33
42	propionitrile	0.047	0.053	-12.8	113	0.00	9.45
43	bromochloromethane	0.291	0.286	1.7	103	0.00	9.65
44	tetrahydrofuran	0.046	0.053	-15.2	109	0.00	9.67
45	chloroform	0.735	0.668	9.1	101	0.00	9.70
46	tert-Butyl Formate	0.291	0.315	-8.2	106	0.00	9.71
47 S	dibromofluoromethane (s)	0.390	0.368	5.6	99	0.00	9.90
48 S	1,2-dichloroethane-d4 (s)	0.409	0.396	3.2	101	0.00	10.32
49	freon 113	0.202	0.220	-8.9	114	-0.01	6.86
50	methacrylonitrile	0.139	0.152	-9.4	107	0.00	9.61
51	1,1,1-trichloroethane	0.559	0.499	10.7	102	0.00	9.92
52	Cyclohexane	0.485	0.449	7.4	103	0.00	9.96
53	2,2,4-trimethylpentane	1.237	1.198	3.2	112	0.00	10.30
54	tert-amyl methyl ether	1.302	1.240	4.8	102	0.00	10.36
55 I	1,4-difluorobenzene	1.000	1.000	0.0	100	0.00	10.73
56	epichlorohydrin	0.023	0.026	-13.0	113	0.00	12.00
57	n-butyl alcohol	0.008	0.009	-12.5	121	0.00	10.88
58	carbon tetrachloride	0.338	0.311	8.0	103	0.00	10.11
59	1,1-dichloropropene	0.338	0.291	13.9	96	0.00	10.09
60	hexane	0.282	0.280	0.7	111	0.00	8.26
61	Tert Amyl Alcohol	0.033	0.034	-4.9	110	0.00	10.25
62	benzene	1.141	1.049	8.1	101	0.00	10.37
63	heptane	0.172	0.171	0.6	116	0.00	10.47
64	isopropyl acetate	0.103	0.113	-9.7	107	0.00	10.27
65	1,2-dichloroethane	0.330	0.337	-2.1	103	0.00	10.41
66	trichloroethene	0.268	0.248	7.5	101	0.00	11.06
67	ethyl acrylate	0.292	0.328	-12.3	106	0.00	11.07
68	2-nitropropane	0.085	0.088	-3.5	108	0.00	11.87
69	2-chloroethyl vinyl ether	0.120	0.132	-10.0	109	0.00	11.85
70	methyl methacrylate	0.173	0.189	-9.2	111	0.00	11.32
71	1,2-dichloropropane	0.295	0.285	3.4	102	0.00	11.34
72	methylcyclohexane	0.367	0.351	4.4	111	0.00	11.25
73	Tert-amyl ethyl ether	0.711	0.692	3.0	100	0.00	11.18
74	dibromomethane	0.172	0.175	-1.7	105	0.00	11.52
75	bromodichloromethane	0.390	0.380	2.6	103	0.00	11.63
76	cis-1,3-dichloropropene	0.480	0.432	10.0	95	0.00	12.07
77 S	toluene-d8 (s)	0.914	0.869	4.9	99	0.00	12.33
78	4-methyl-2-pentanone	0.099	0.109	-10.1	111	0.00	12.16
79	toluene	1.166	1.035	11.2	99	0.00	12.40
80	3-methyl-1-butanol	0.008	0.009	-12.5	118	0.00	12.18
81	trans-1,3-dichloropropene	0.405	0.410	-1.2	103	0.00	12.63
82	ethyl methacrylate	0.352	0.347	1.4	103	0.00	12.58
83	1,1,2-trichloroethane	0.210	0.207	1.4	105	0.00	12.84
84	2-hexanone	0.094	0.109	-16.0	112	0.00	12.99
85 I	chlorobenzene-d5	1.000	1.000	0.0	101	0.00	13.82
86	tetrachloroethene	0.370	0.316	14.6	101	0.00	12.97
87	1,3-dichloropropane	0.481	0.467	2.9	104	0.00	13.02
88	butyl acetate	0.195	0.211	-8.2	113	0.00	13.04
89	dibromochloromethane	0.372	0.372	0.0	105	0.00	13.27
90	1,2-dibromoethane	0.296	0.300	-1.4	104	0.00	13.43
91	3,3-Dimethyl-1-Butanol	0.034	0.037	-8.8	120	0.00	13.15
92	chlorobenzene	0.965	0.857	11.2	100	0.00	13.86
93	1,1,1,2-tetrachloroethane	0.358	0.334	6.7	100	0.00	13.91
94	ethylbenzene	1.523	1.325	13.0	99	0.00	13.89
95	m,p-xylene	0.617	0.518	16.0	99	0.00	13.99

Initial Calibration Verification

Job Number: JB37147

Sample: VY5710-ICV5710

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: Y132613.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

96	o-xylene	1.260	1.121	11.0	99	0.00	14.41
97	styrene	1.029	0.951	7.6	100	0.00	14.43
98	bromoform	0.253	0.258	-2.0	105	0.00	14.72
99 I	1,4-dichlorobenzene-d4	1.000	1.000	0.0	102	0.00	16.10
100	isopropylbenzene	2.503	2.286	8.7	99	0.00	14.73
101 S	4-bromofluorobenzene (s)	0.793	0.759	4.3	101	0.00	14.96
102	bromobenzene	0.821	0.739	10.0	101	0.00	15.15
		-----	True	Calc.	% Drift		-----
103	cyclohexanone	500.000	517.574	-3.5	125	0.00	14.95
		-----	AvgRF	CCRF	% Dev		-----
104	1,1,2,2-tetrachloroethane	0.718	0.721	-0.4	106	0.00	15.08
105	trans-1,4-dichloro-2-bute	0.179	0.192	-7.3	108	0.00	15.12
106	1,2,3-trichloropropane	0.170	0.170	0.0	105	0.00	15.15
107	n-propylbenzene	2.981	2.767	7.2	101	0.00	15.14
108	4-Ethyltoluene	2.565	2.278	11.2	96	0.00	15.24
109	2-chlorotoluene	0.642	0.607	5.5	99	0.00	15.30
110	4-chlorotoluene	1.957	1.820	7.0	98	0.00	15.40
111	1,3,5-trimethylbenzene	2.144	2.018	5.9	104	0.00	15.28
112	tert-butylbenzene	1.776	1.606	9.6	98	0.00	15.62
113	pentachloroethane	0.509	0.487	4.3	100	0.00	15.73
114	1,2,4-trimethylbenzene	2.216	2.092	5.6	100	0.00	15.68
115	sec-butylbenzene	2.684	2.432	9.4	100	0.00	15.84
116	1,3-dichlorobenzene	1.437	1.326	7.7	99	0.00	16.05
117	p-isopropyltoluene	2.240	2.117	5.5	102	0.00	15.95
118	1,4-dichlorobenzene	1.440	1.361	5.5	99	0.00	16.13
119	1,2-dichlorobenzene	1.393	1.321	5.2	101	0.00	16.52
120	n-butylbenzene	0.489	0.491	-0.4	109	0.00	16.37
121	p-Diethylbenzene	1.374	1.248	9.2	98	0.00	16.33
122	1,2-dibromo-3-chloropropene	0.137	0.149	-8.8	109	0.00	17.31
123	1,3,5-Trichlorobenzene	1.086	1.013	6.7	97	0.00	17.46
124	1,2,4-trichlorobenzene	0.960	0.937	2.4	97	0.00	18.10
125	1,2,4,5-tetramethylbenzen	2.279	2.148	5.7	100	0.00	17.11
126	hexachlorobutadiene	0.545	0.489	10.3	100	0.00	18.19
127	naphthalene	1.888	2.052	-8.7	106	0.00	18.40
128	1,2,3-trichlorobenzene	0.866	0.869	-0.3	102	0.00	18.65
129	hexachloroethane	0.486	0.428	11.9	97	0.00	16.76
130	Benzyl chloride	1.396	1.375	1.5	105	0.00	16.26

(#= Out of Range
Y132607.D MY5710.MSPCC's out = 0 CCC's out = 0
Thu Apr 04 10:03:35 2013 RPT1

Initial Calibration Verification

Job Number: JB37147

Account: AQTPAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: VY5710-ICV5710

Lab FileID: Y132614.D

Evaluate Continuing Calibration Report

Data File : C:\MSDChem\1\DATA\Y132614.D Vial: 15
 Acq On : 2 Apr 2013 5:21 pm Operator: ROBERTS
 Sample : ICV5710-50 Inst : MSY
 Misc : MS45471,VY5710,5.0,,,1 Multiplr: 1.00
 MS Integration Params: LSCINT.P

Method : C:\MSDCHEM\1\METHODS\MY5710.M (RTE Integrator)
 Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 Last Update : Thu Apr 04 09:48:17 2013
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1 I	Tert Butyl Alcohol-d9	1.000	1.000	0.0	122	0.00	7.63
2	1,4-dioxane		-----NA-----				
3	tertiary butyl alcohol		-----NA-----				
4 I	pentafluorobenzene	1.000	1.000	0.0	101	0.00	9.81
5	propene		-----NA-----				
6	freon 141b		-----NA-----				
7	freon 142b		-----NA-----				
8	freon 143a		-----NA-----				
9	chlorodifluoromethane		-----NA-----				
10	dichlorodifluoromethane		-----NA-----				
11	chloromethane		-----NA-----				
12	vinyl chloride		-----NA-----				
13	bromomethane		-----NA-----				
14	chloroethane		-----NA-----				
15	Vinyl Bromide		-----NA-----				
16	trichlorofluoromethane		-----NA-----				
17	ethyl ether		-----NA-----				
18	2-chloropropane		-----NA-----				
19	acrolein		-----NA-----				
20	1,1-dichloroethene		-----NA-----				
21	acetone		-----NA-----				
22	allyl chloride		-----NA-----				
23	acetonitrile		-----NA-----				
24	iodomethane		-----NA-----				
25	iso-butyl alcohol		-----NA-----				
26	carbon disulfide		-----NA-----				
27	1-chloropropane		-----NA-----				
28	methylene chloride		-----NA-----				
29	methyl acetate	True 50.000	Calc. 51.858	% Drift -3.7	105	0.00	7.46
30	methyl tert butyl ether	AvgRF	CCRF	% Dev	-----NA-----		
31	trans-1,2-dichloroethene		-----NA-----				
32	di-isopropyl ether		-----NA-----				
33	ethyl tert-butyl ether		-----NA-----				
34	2-butanone		-----NA-----				
35	1,1-dichloroethane		-----NA-----				
36	chloroprene		-----NA-----				
37	acrylonitrile		-----NA-----				

Initial Calibration Verification

Job Number: JB37147

Sample: VY5710-ICV5710

Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Lab FileID: Y132614.D

38	vinyl acetate	0.058	0.067	-15.5	110	-0.01	8.57
39	ethyl acetate	0.049	0.051	-4.1	96	0.00	9.30
40	2,2-dichloropropane			-----NA-----			
41	cis-1,2-dichloroethene			-----NA-----			
42	propionitrile			-----NA-----			
43	bromochloromethane			-----NA-----			
44	tetrahydrofuran			-----NA-----			
45	chloroform			-----NA-----			
46	tert-Butyl Formate			-----NA-----			
47 S	dibromofluoromethane (s)	0.390	0.381	2.3	103	0.00	9.90
48 S	1,2-dichloroethane-d4 (s)	0.409	0.404	1.2	104	0.00	10.32
49	freon 113			-----NA-----			
50	methacrylonitrile			-----NA-----			
51	1,1,1-trichloroethane			-----NA-----			
52	Cyclohexane			-----NA-----			
53	2,2,4-trimethylpentane			-----NA-----			
54	tert-amyl methyl ether			-----NA-----			
55 I	1,4-difluorobenzene	1.000	1.000	0.0	101	0.00	10.73
56	epichlorohydrin			-----NA-----			
57	n-butyl alcohol			-----NA-----			
58	carbon tetrachloride			-----NA-----			
59	1,1-dichloropropene			-----NA-----			
60	hexane			-----NA-----			
61	Tert Amyl Alcohol			-----NA-----			
62	benzene			-----NA-----			
63	heptane			-----NA-----			
64	isopropyl acetate	0.103	0.114	-10.7	109	0.00	10.27
65	1,2-dichloroethane			-----NA-----			
66	trichloroethene			-----NA-----			
67	ethyl acrylate			-----NA-----			
68	2-nitropropane			-----NA-----			
69	2-chloroethyl vinyl ether			-----NA-----			
70	methyl methacrylate			-----NA-----			
71	1,2-dichloropropane			-----NA-----			
72	methylcyclohexane			-----NA-----			
73	Tert-amyl ethyl ether			-----NA-----			
74	dibromomethane			-----NA-----			
75	bromodichloromethane			-----NA-----			
76	cis-1,3-dichloropropene			-----NA-----			
77 S	toluene-d8 (s)	0.914	0.911	0.3	105	0.00	12.33
78	4-methyl-2-pentanone			-----NA-----			
79	toluene			-----NA-----			
80	3-methyl-1-butanol			-----NA-----			
81	trans-1,3-dichloropropene			-----NA-----			
82	ethyl methacrylate			-----NA-----			
83	1,1,2-trichloroethane			-----NA-----			
84	2-hexanone			-----NA-----			
85 I	chlorobenzene-d5	1.000	1.000	0.0	102	0.00	13.82
86	tetrachloroethene			-----NA-----			
87	1,3-dichloropropane			-----NA-----			
88	butyl acetate	0.195	0.214	-9.7	115	0.00	13.04
89	dibromochloromethane			-----NA-----			
90	1,2-dibromoethane			-----NA-----			
91	3,3-Dimethyl-1-Butanol			-----NA-----			
92	chlorobenzene			-----NA-----			
93	1,1,1,2-tetrachloroethane			-----NA-----			
94	ethylbenzene			-----NA-----			
95	m,p-xylene			-----NA-----			

Initial Calibration Verification

Job Number: JB37147

Sample: VY5710-ICV5710

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: Y132614.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

96	o-xylene	-----	-NA-----								
97	styrene	-----	-NA-----								
98	bromoform	-----	-NA-----								
99 I	1,4-dichlorobenzene-d4	1.000	1.000	0.0	103	0.00	16.10				
100	isopropylbenzene	-----	-NA-----								
101 S	4-bromofluorobenzene (s)	0.793	0.771	2.8	103	0.00	14.96				
102	bromobenzene	-----	-NA-----								
		-----	True	Calc.	% Drift	-----					
103	cyclohexanone	-----	-NA-----								
		-----	AvgRF	CCRF	% Dev	-----					
104	1,1,2,2-tetrachloroethane	-----	-NA-----								
105	trans-1,4-dichloro-2-bute	-----	-NA-----								
106	1,2,3-trichloropropane	-----	-NA-----								
107	n-propylbenzene	-----	-NA-----								
108	4-Ethyltoluene	-----	-NA-----								
109	2-chlorotoluene	-----	-NA-----								
110	4-chlorotoluene	-----	-NA-----								
111	1,3,5-trimethylbenzene	-----	-NA-----								
112	tert-butylbenzene	-----	-NA-----								
113	pentachloroethane	-----	-NA-----								
114	1,2,4-trimethylbenzene	-----	-NA-----								
115	sec-butylbenzene	-----	-NA-----								
116	1,3-dichlorobenzene	-----	-NA-----								
117	p-isopropyltoluene	-----	-NA-----								
118	1,4-dichlorobenzene	-----	-NA-----								
119	1,2-dichlorobenzene	-----	-NA-----								
120	n-butylbenzene	-----	-NA-----								
121	p-Diethylbenzene	-----	-NA-----								
122	1,2-dibromo-3-chloropropa	-----	-NA-----								
123	1,3,5-Trichlorobenzene	-----	-NA-----								
124	1,2,4-trichlorobenzene	-----	-NA-----								
125	1,2,4,5-tetramethylbenzen	-----	-NA-----								
126	hexachlorobutadiene	-----	-NA-----								
127	naphthalene	-----	-NA-----								
128	1,2,3-trichlorobenzene	-----	-NA-----								
129	hexachloroethane	-----	-NA-----								
130	Benzyl chloride	-----	-NA-----								
		-----	-----								
		-----	-----								

(#) = Out of Range
Y132607.D MY5710.MSPCC's out = 0 CCC's out = 0
Thu Apr 04 10:03:10 2013 RPT1

Continuing Calibration Summary

Page 1 of 3

Job Number: JB37147

Sample: VY5787-CC5710

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: Y134372.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\MSDCHEM\1\DATA\Y134372.D Vial: 27
 Acq On : 18 May 2013 10:18 pm Operator: ROBERTS
 Sample : CC5710-50 Inst : MSY
 Misc : MS48482,VY5787,5.0,,,1 Multiplr: 1.00
 MS Integration Params: LSCINT.P

Method : C:\MSDCHEM\1\METHODS\MY5710.M (RTE Integrator)
 Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 Last Update : Tue May 07 15:14:28 2013
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1 I	Tert Butyl Alcohol-d9	1.000	1.000	0.0	69	0.00	7.63
2	1,4-dioxane	0.099	0.120	-21.2#	78	0.00	11.45
3	tertiary butyl alcohol	1.265	1.453	-14.9	83	0.00	7.76
4 I	pentafluorobenzene	1.000	1.000	0.0	75	0.00	9.82
5	propene			-----NA-----			
6	freon 141b			-----NA-----			
7	freon 142b			-----NA-----			
8	freon 143a			-----NA-----			
9	chlorodifluoromethane	0.364	0.365	-0.3	82	0.00	4.18
10	dichlorodifluoromethane	0.444	0.479	-7.9	91	0.00	4.15
11	chloromethane	0.458	0.416	9.2	69	0.00	4.52
12	vinyl chloride	0.521	0.460	11.7	74	0.00	4.78
13	1,3-butadiene			-----NA-----			
14	bromomethane	0.303	0.329	-8.6	85	0.00	5.46
15	chloroethane	0.238	0.215	9.7	74	0.00	5.64
16	Vinyl Bromide			-----NA-----			
17	trichlorofluoromethane	0.515	0.620	-20.4#	103	0.00	6.09
18	ethyl ether	0.225	0.246	-9.3	82	0.00	6.48
19	2-chloropropane	0.141	0.135	4.3	77	0.00	6.70
20	acrolein	0.065	0.053	18.5	63	0.00	6.80
21	1,1-dichloroethene	0.504	0.506	-0.4	80	0.00	6.92
22	acetone	0.029	0.028	3.4	76	0.00	7.03
23	allyl chloride	0.218	0.226	-3.7	80	0.00	7.46
24	acetonitrile	0.017	0.019	-11.8	82	0.00	7.50
25	iodomethane	0.711	0.830	-16.7	95	0.00	7.22
26	iso-butyl alcohol	0.014	0.013	7.1	72	0.00	10.14
27	carbon disulfide	1.165	1.154	0.9	82	0.00	7.34
28	1-chloropropane	0.027	0.029	-7.4	85	0.00	7.69
29	methylene chloride	0.566	0.574	-1.4	80	0.00	7.68
30	methyl acetate	50.000	57.405	-14.8	87	-0.01	7.45
31	methyl tert butyl ether	1.155	1.336	-15.7	89	0.00	7.95
32	trans-1,2-dichloroethene	0.516	0.528	-2.3	82	0.00	8.02
33	di-isopropyl ether	1.384	1.341	3.1	76	0.00	8.52
34	ethyl tert-butyl ether	1.294	1.411	-9.0	83	0.00	8.98
35	2-butanone	0.040	0.043	-7.5	81	0.00	9.31
36	1,1-dichloroethane	0.687	0.723	-5.2	84	0.00	8.60
37	chloroprene	0.464	0.495	-6.7	87	0.00	8.69

6.9.4
6

Continuing Calibration Summary

Job Number: JB37147

Sample: VY5787-CC5710

Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Lab FileID: Y134372.D

38	acrylonitrile	0.122	0.116	4.9	74	0.00	8.04
39	vinyl acetate	0.058	0.071	-22.4#	86	-0.02	8.57
40	ethyl acetate	0.049	0.047	4.1	66	-0.01	9.29
41	2,2-dichloropropane	0.528	0.545	-3.2	87	0.00	9.32
42	cis-1,2-dichloroethene	0.454	0.491	-8.1	87	0.00	9.33
43	propionitrile	0.047	0.047	0.0	75	0.00	9.45
44	bromochloromethane	0.291	0.347	-19.2	93	0.00	9.65
45	tetrahydrofuran	0.046	0.052	-13.0	79	0.00	9.67
46	chloroform	0.735	0.832	-13.2	94	0.00	9.70
47	tert-Butyl Formate	0.291	0.356	-22.3#	89	0.00	9.71
48 S	dibromofluoromethane (s)	0.390	0.413	-5.9	83	0.00	9.90
49 S	1,2-dichloroethane-d4 (s)	0.409	0.392	4.2	75	0.00	10.32
50	freon 113	0.202	0.238	-17.8	92	0.00	6.87
51	methacrylonitrile	0.139	0.146	-5.0	77	0.00	9.61
52	1,1,1-trichloroethane	0.559	0.645	-15.4	98	0.00	9.92
53	Cyclohexane	0.485	0.440	9.3	76	0.00	9.97
54	2,2,4-trimethylpentane	1.237	1.051	15.0	74	0.00	10.30
55	tert-amyl methyl ether	1.302	1.386	-6.5	85	0.00	10.37
56 I	1,4-difluorobenzene	1.000	1.000	0.0	72	0.00	10.73
57	epichlorohydrin	0.023	0.023	0.0	73	0.00	12.00
58	n-butyl alcohol	0.008	0.008	0.0	72	0.00	10.88
59	carbon tetrachloride	0.338	0.419	-24.0#	101	0.00	10.11
60	1,1-dichloropropene	0.338	0.341	-0.9	81	0.00	10.09
61	hexane	0.282	0.264	6.4	76	0.00	8.26
62	Tert Amyl Alcohol	0.033	0.018	45.5#	42#	0.00	10.25
63	benzene	1.141	1.157	-1.4	81	0.00	10.37
64	heptane			-----NA-----			
65	isopropyl acetate	0.103	0.111	-7.8	76	0.00	10.27
66	1,2-dichloroethane	0.330	0.433	-31.2#	96	0.00	10.41
67	trichloroethene	0.268	0.289	-7.8	86	0.00	11.06
68	ethyl acrylate			-----NA-----			
69	2-nitropropane	0.085	0.078	8.2	69	0.00	11.87
70	2-chloroethyl vinyl ether	0.120	0.094	21.7#	56	0.00	11.85
71	methyl methacrylate	0.173	0.178	-2.9	76	0.00	11.32
72	1,2-dichloropropane	0.295	0.291	1.4	76	0.00	11.34
73	methylcyclohexane	0.367	0.363	1.1	83	0.00	11.24
74	Tert-amyl ethyl ether	0.711	0.383	46.1#	40#	0.00	11.18
75	dibromomethane	0.172	0.208	-20.9#	91	0.00	11.52
76	bromodichloromethane	0.390	0.480	-23.1#	94	0.00	11.63
77	cis-1,3-dichloropropene	0.480	0.499	-4.0	79	0.00	12.07
78 S	toluene-d8 (s)	0.914	0.925	-1.2	76	0.00	12.33
79	4-methyl-2-pentanone	0.099	0.096	3.0	71	0.00	12.15
80	toluene	1.166	1.124	3.6	78	0.00	12.40
81	3-methyl-1-butanol	0.008	0.007	12.5	75	0.00	12.18
82	trans-1,3-dichloropropene	0.405	0.449	-10.9	81	0.00	12.62
83	ethyl methacrylate	0.352	0.340	3.4	73	0.00	12.58
84	1,1,2-trichloroethane	0.210	0.223	-6.2	82	0.00	12.83
85	2-hexanone	0.094	0.082	12.8	61	0.00	12.99
86 I	chlorobenzene-d5	1.000	1.000	0.0	68	0.00	13.82
87	tetrachloroethene	0.370	0.405	-9.5	88	0.00	12.97
88	1,3-dichloropropane	0.481	0.533	-10.8	80	0.00	13.01
89	butyl acetate	0.195	0.209	-7.2	75	0.00	13.04
90	dibromochloromethane	0.372	0.502	-34.9#	96	0.00	13.27
91	1,2-dibromoethane	0.296	0.370	-25.0#	86	0.00	13.43
92	3,3-Dimethyl-1-Butanol	0.034	0.032	5.9	68	0.00	13.15
93	chlorobenzene	0.965	0.984	-2.0	77	0.00	13.85
94	1,1,1,2-tetrachloroethane	0.358	0.437	-22.1#	89	0.00	13.91
95	ethylbenzene	1.523	1.507	1.1	76	0.00	13.89

Continuing Calibration Summary

Job Number: JB37147

Sample: VY5787-CC5710

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: Y134372.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

96	m,p-xylene	0.617	0.571	7.5	74	0.00	13.99
97	o-xylene	1.260	1.283	-1.8	77	0.00	14.40
98	styrene	1.029	1.028	0.1	73	0.00	14.42
99	bromoform	0.253	0.332	-31.2#	92	0.00	14.71
100	I 1,4-dichlorobenzene-d4	1.000	1.000	0.0	65	0.00	16.10
101	isopropylbenzene	2.503	2.723	-8.8	75	0.00	14.73
102	S 4-bromofluorobenzene (s)	0.793	0.812	-2.4	68	0.00	14.96
103	bromobenzene	0.821	0.918	-11.8	79	0.00	15.15
104	cyclohexanone	0.021	0.074	-252.4#	232#	0.00	14.95
105	1,1,2,2-tetrachloroethane	0.718	0.800	-11.4	74	0.00	15.07
106	trans-1,4-dichloro-2-bute	0.179	0.194	-8.4	69	0.00	15.11
107	1,2,3-trichloropropane	0.170	0.223	-31.2#	87	0.00	15.15
108	n-propylbenzene	2.981	3.090	-3.7	72	0.00	15.14
109	4-Ethyltoluene			-----NA-----			
110	2-chlorotoluene	0.642	0.707	-10.1	73	0.00	15.29
111	4-chlorotoluene	1.957	2.141	-9.4	73	0.00	15.39
112	1,3,5-trimethylbenzene	2.144	2.369	-10.5	77	0.00	15.28
113	tert-butylbenzene	1.776	1.914	-7.8	74	0.00	15.62
114	pentachloroethane	0.509	0.585	-14.9	76	0.00	15.73
115	1,2,4-trimethylbenzene	2.216	2.418	-9.1	73	0.00	15.67
116	sec-butylbenzene	2.684	2.740	-2.1	71	0.00	15.83
117	1,3-dichlorobenzene	1.437	1.532	-6.6	73	0.00	16.05
118	p-isopropyltoluene	2.240	2.342	-4.6	72	0.00	15.95
119	1,4-dichlorobenzene	1.440	1.568	-8.9	72	0.00	16.13
120	1,2-dichlorobenzene	1.393	1.549	-11.2	75	0.00	16.52
121	n-butylbenzene	0.489	0.502	-2.7	71	0.00	16.36
122	p-Diethylbenzene			-----NA-----			
123	1,2-dibromo-3-chloropropene	0.137	0.173	-26.3#	80	0.00	17.31
124	1,3,5-Trichlorobenzene	1.086	1.109	-2.1	67	0.00	17.46
125	1,2,4-trichlorobenzene	0.960	1.018	-6.0	67	0.00	18.10
126	1,2,4,5-tetramethylbenzen			-----NA-----			
127	hexachlorobutadiene	0.545	0.581	-6.6	76	0.00	18.19
128	naphthalene	1.888	2.174	-15.1	71	0.00	18.39
129	1,2,3-trichlorobenzene	0.866	0.951	-9.8	71	0.00	18.65
130	hexachloroethane	0.486	0.562	-15.6	81	0.00	16.76
131	Benzyl chloride	1.396	1.311	6.1	64	0.00	16.25
<hr/>							

(#= Out of Range
Y132607.D MY5710.MSPCC's out = 0 CCC's out = 0
Tue May 21 15:40:49 2013 RPT16.9.4
6

Continuing Calibration Summary

Page 1 of 3

Job Number: JB37147

Sample: VY5790-CC5710

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: Y134445.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\MSDCHEM\1\DATA\Y134445.D Vial: 2
 Acq On : 21 May 2013 11:51 am Operator: ROBERTS
 Sample : CC5710-20 Inst : MSY
 Misc : MS48559, VY5790, 5.0, , , , 1 Multiplr: 1.00
 MS Integration Params: LSCINT.P

Method : C:\MSDCHEM\1\METHODS\MY5710.M (RTE Integrator)
 Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 Last Update : Tue May 07 15:14:28 2013
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I Tert Butyl Alcohol-d9	1.000	1.000	0.0	107	0.00	7.63
2	1,4-dioxane	0.099	0.096	3.0	95	0.00	11.45
3	tertiary butyl alcohol	1.265	1.314	-3.9	113	-0.01	7.75
4	I pentafluorobenzene	1.000	1.000	0.0	91	0.00	9.81
5	propene			-----NA-----			
6	freon 141b			-----NA-----			
7	freon 142b			-----NA-----			
8	freon 143a			-----NA-----			
9	chlorodifluoromethane	0.364	0.451	-23.9#	111	-0.01	4.17
10	dichlorodifluoromethane	0.444	0.469	-5.6	95	0.00	4.14
11	chloromethane	0.458	0.489	-6.8	94	-0.01	4.51
12	vinyl chloride	0.521	0.529	-1.5	93	0.00	4.77
13	1,3-butadiene			-----NA-----			
14	bromomethane	0.303	0.341	-12.5	102	-0.01	5.45
15	chloroethane	0.238	0.254	-6.7	96	0.00	5.63
16	Vinyl Bromide			-----NA-----			
17	trichlorofluoromethane	0.515	0.577	-12.0	102	0.00	6.08
18	ethyl ether	0.225	0.246	-9.3	102	0.00	6.47
19	2-chloropropane	0.141	0.157	-11.3	97	0.00	6.70
20	acrolein	0.065	0.059	9.2	89	0.00	6.80
21	1,1-dichloroethene	0.504	0.537	-6.5	91	-0.01	6.91
22	acetone	0.029	0.032	-10.3	87	0.00	7.03
23	allyl chloride	0.218	0.215	1.4	89	0.00	7.46
24	acetonitrile	0.017	0.021	-23.5#	120	0.00	7.50
25	iodomethane	0.711	0.759	-6.8	101	0.00	7.23
26	iso-butyl alcohol	0.014	0.016	-14.3	109	0.00	10.14
27	carbon disulfide	1.165	1.198	-2.8	93	0.00	7.33
28	1-chloropropane	0.027	0.033	-22.2#	107	0.00	7.68
29	methylene chloride	0.566	0.646	-14.1	102	-0.01	7.67
30	methyl acetate	20.000	23.617	True	Calc.	% Drift	-----
				-18.1	122	0.00	7.46
31	methyl tert butyl ether	1.155	1.321	AvgRF	CCRF	% Dev	-----
32	trans-1,2-dichloroethene	0.516	0.562	-14.4	112	0.00	7.95
33	di-isopropyl ether	1.384	1.571	-8.9	96	0.00	8.01
34	ethyl tert-butyl ether	1.294	1.459	-13.5	109	0.00	8.51
35	2-butanone	0.040	0.042	-12.8	108	-0.01	8.97
36	1,1-dichloroethane	0.687	0.755	-5.0	99	-0.01	9.31
37	chloroprene	0.464	0.514	-9.9	101	0.00	8.59
				-10.8	100	-0.01	8.68

6.6.5
6

Continuing Calibration Summary

Page 2 of 3

Job Number: JB37147

Sample: VY5790-CC5710

Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Lab FileID: Y134445.D

38	acrylonitrile	0.122	0.141	-15.6	111	0.00	8.04
39	vinyl acetate	0.058	0.069	-19.0	123	-0.01	8.57
40	ethyl acetate	0.049	0.059	-20.4#	115	0.00	9.30
41	2,2-dichloropropane	0.528	0.584	-10.6	100	0.00	9.31
42	cis-1,2-dichloroethene	0.454	0.467	-2.9	97	0.00	9.33
43	propionitrile	0.047	0.056	-19.1	118	0.00	9.45
44	bromochloromethane	0.291	0.314	-7.9	105	-0.01	9.64
45	tetrahydrofuran	0.046	0.054	-17.4	116	0.00	9.67
46	chloroform	0.735	0.776	-5.6	102	-0.01	9.69
47	tert-Butyl Formate	0.291	0.375	-28.9#	121	0.00	9.70
48 S	dibromofluoromethane (s)	0.390	0.401	-2.8	97	-0.02	9.89
49 S	1,2-dichloroethane-d4 (s)	0.409	0.380	7.1	88	0.00	10.32
50	freon 113	0.202	0.257	-27.2#	108	0.00	6.87
51	methacrylonitrile	0.139	0.156	-12.2	108	0.00	9.61
52	1,1,1-trichloroethane	0.559	0.598	-7.0	97	-0.01	9.92
53	Cyclohexane	0.485	0.516	-6.4	92	0.00	9.96
54	2,2,4-trimethylpentane	1.237	1.379	-11.5	107	-0.01	10.30
55	tert-amyl methyl ether	1.302	1.403	-7.8	108	-0.01	10.36
56 I	1,4-difluorobenzene	1.000	1.000	0.0	89	-0.01	10.73
57	epichlorohydrin	0.023	0.028	-21.7#	111	0.00	12.00
58	n-butyl alcohol	0.008	0.009	-12.5	103	0.00	10.88
59	carbon tetrachloride	0.338	0.401	-18.6	102	0.00	10.10
60	1,1-dichloropropene	0.338	0.363	-7.4	93	0.00	10.09
61	hexane	0.282	0.348	-23.4#	108	0.00	8.25
62	Tert Amyl Alcohol	0.033	0.019	42.4#	58	0.00	10.25
63	benzene	1.141	1.178	-3.2	95	0.00	10.36
64	heptane			-----NA-----			
65	isopropyl acetate	0.103	0.136	-32.0#	112	0.00	10.27
66	1,2-dichloroethane	0.330	0.402	-21.8#	111	0.00	10.41
67	trichloroethene	0.268	0.282	-5.2	93	-0.01	11.06
68	ethyl acrylate			-----NA-----			
69	2-nitropropane	0.085	0.086	-1.2	97	0.00	11.86
70	2-chloroethyl vinyl ether	0.120	0.129	-7.5	98	0.00	11.85
71	methyl methacrylate	0.173	0.200	-15.6	111	0.00	11.32
72	1,2-dichloropropane	0.295	0.335	-13.6	107	-0.01	11.34
73	methylcyclohexane	0.367	0.429	-16.9	108	0.00	11.24
74	Tert-amyl ethyl ether	0.711	0.404	43.2#	52	-0.01	11.17
75	dibromomethane	0.172	0.195	-13.4	107	0.00	11.51
76	bromodichloromethane	0.390	0.438	-12.3	106	-0.01	11.63
77	cis-1,3-dichloropropene	0.480	0.524	-9.2	104	0.00	12.07
78 S	toluene-d8 (s)	0.914	1.001	-9.5	95	0.00	12.33
79	4-methyl-2-pentanone	0.099	0.121	-22.2#	116	0.00	12.15
80	toluene	1.166	1.174	-0.7	94	0.00	12.40
81	3-methyl-1-butanol	0.008	0.009	-12.5	106	0.00	12.18
82	trans-1,3-dichloropropene	0.405	0.476	-17.5	110	0.00	12.62
83	ethyl methacrylate	0.352	0.385	-9.4	107	0.00	12.58
84	1,1,2-trichloroethane	0.210	0.228	-8.6	107	0.00	12.83
85	2-hexanone	0.094	0.118	-25.5#	114	0.00	12.99
86 I	chlorobenzene-d5	1.000	1.000	0.0	89	0.00	13.82
87	tetrachloroethene	0.370	0.381	-3.0	93	0.00	12.96
88	1,3-dichloropropane	0.481	0.552	-14.8	111	0.00	13.01
89	butyl acetate	0.195	0.241	-23.6#	110	0.00	13.04
90	dibromochloromethane	0.372	0.452	-21.5#	117	0.00	13.27
91	1,2-dibromoethane	0.296	0.354	-19.6	111	0.00	13.43
92	3,3-Dimethyl-1-Butanol	0.034	0.039	-14.7	107	0.00	13.15
93	chlorobenzene	0.965	0.972	-0.7	97	0.00	13.85
94	1,1,1,2-tetrachloroethane	0.358	0.393	-9.8	103	0.00	13.91
95	ethylbenzene	1.523	1.524	-0.1	92	0.00	13.89

6.9.5
6

Continuing Calibration Summary

Job Number: JB37147

Sample: VY5790-CC5710

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: Y134445.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

96	m,p-xylene	0.617	0.580	6.0	90	0.00	13.99
97	o-xylene	1.260	1.249	0.9	93	0.00	14.40
98	styrene	1.029	1.002	2.6	92	0.00	14.42
99	bromoform	0.253	0.321	-26.9#	125	0.00	14.71
100	I 1,4-dichlorobenzene-d4	1.000	1.000	0.0	86	0.00	16.10
101	isopropylbenzene	2.503	2.771	-10.7	90	0.00	14.73
102	S 4-bromofluorobenzene (s)	0.793	0.796	-0.4	84	0.00	14.96
103	bromobenzene	0.821	0.871	-6.1	99	0.00	15.15
104	cyclohexanone	0.021	0.108	-414.3#	486#	0.00	14.95
105	1,1,2,2-tetrachloroethane	0.718	0.883	-23.0#	113	0.00	15.07
106	trans-1,4-dichloro-2-bute	0.179	0.205	-14.5	103	0.00	15.11
107	1,2,3-trichloropropane	0.170	0.222	-30.6#	117	0.00	15.15
108	n-propylbenzene	2.981	3.261	-9.4	89	0.00	15.14
109	4-Ethyltoluene			-----NA-----			
110	2-chlorotoluene	0.642	0.712	-10.9	94	0.00	15.30
111	4-chlorotoluene	1.957	2.088	-6.7	89	0.00	15.39
112	1,3,5-trimethylbenzene	2.144	2.324	-8.4	91	0.00	15.28
113	tert-butylbenzene	1.776	1.906	-7.3	88	0.00	15.62
114	pentachloroethane	0.509	0.607	-19.3	105	0.00	15.73
115	1,2,4-trimethylbenzene	2.216	2.372	-7.0	89	0.00	15.67
116	sec-butylbenzene	2.684	2.917	-8.7	88	0.00	15.83
117	1,3-dichlorobenzene	1.437	1.502	-4.5	92	0.00	16.05
118	p-isopropyltoluene	2.240	2.420	-8.0	87	0.00	15.95
119	1,4-dichlorobenzene	1.440	1.573	-9.2	92	0.00	16.12
120	1,2-dichlorobenzene	1.393	1.500	-7.7	96	0.00	16.52
121	n-butylbenzene	0.489	0.559	-14.3	93	0.00	16.36
122	p-Diethylbenzene			-----NA-----			
123	1,2-dibromo-3-chloropropene	0.137	0.184	-34.3#	117	0.00	17.31
124	1,3,5-Trichlorobenzene	1.086	1.232	-13.4	91	0.00	17.46
125	1,2,4-trichlorobenzene	0.960	1.115	-16.1	94	0.00	18.10
126	1,2,4,5-tetramethylbenzen			-----NA-----			
127	hexachlorobutadiene	0.545	0.675	-23.9#	98	0.00	18.19
128	naphthalene	1.888	2.216	-17.4	95	0.00	18.39
129	1,2,3-trichlorobenzene	0.866	1.043	-20.4#	98	0.00	18.65
130	hexachloroethane	0.486	0.533	-9.7	94	0.00	16.75
131	Benzyl chloride	1.396	1.667	-19.4	102	0.00	16.25
<hr/>							

(#= Out of Range
Y132606.D MY5710.MSPCC's out = 0 CCC's out = 0
Thu May 23 08:44:22 2013 RPT166.9
6

Continuing Calibration Summary

Page 1 of 3

Job Number: JB37147

Sample: VY5790-CC5710

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: Y134494.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\MSDChem\1\DATA\Y134494.D Vial: 2
 Acq On : 22 May 2013 4:06 pm Operator: ROBERTS
 Sample : CC5710-20 Inst : MSY
 Misc : MS48559,VY5790,5.0,,,1 Multiplr: 1.00
 MS Integration Params: LSCINT.P

Method : C:\MSDCHEM\1\METHODS\MY5710.M (RTE Integrator)
 Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 Last Update : Tue May 07 15:14:28 2013
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1 I	Tert Butyl Alcohol-d9	1.000	1.000	0.0	119	0.00	7.64
2	1,4-dioxane	0.099	0.099	0.0	109	0.00	11.45
3	tertiary butyl alcohol	1.265	1.220	3.6	118	0.00	7.75
4 I	pentafluorobenzene	1.000	1.000	0.0	90	-0.01	9.81
5	propene			-----NA-----			
6	freon 141b			-----NA-----			
7	freon 142b			-----NA-----			
8	freon 143a			-----NA-----			
9	chlorodifluoromethane	0.364	0.429	-17.9	105	-0.01	4.17
10	dichlorodifluoromethane	0.444	0.524	-18.0	106	0.00	4.15
11	chloromethane	0.458	0.566	-23.6#	108	-0.01	4.51
12	vinyl chloride	0.521	0.553	-6.1	96	-0.01	4.76
13	1,3-butadiene			-----NA-----			
14	bromomethane	0.303	0.392	-29.4#	116	0.00	5.45
15	chloroethane	0.238	0.277	-16.4	104	0.00	5.63
16	Vinyl Bromide			-----NA-----			
17	trichlorofluoromethane	0.515	0.674	-30.9#	118	-0.02	6.07
18	ethyl ether	0.225	0.265	-17.8	109	-0.01	6.47
19	2-chloropropane	0.141	0.160	-13.5	98	0.00	6.69
20	acrolein	0.065	0.090	-38.5#	136	0.00	6.79
21	1,1-dichloroethene	0.504	0.558	-10.7	94	0.00	6.92
22	acetone	0.029	0.034	-17.2	90	0.00	7.03
23	allyl chloride	0.218	0.252	-15.6	104	0.00	7.46
24	acetonitrile	0.017	0.020	-17.6	114	0.00	7.52
25	iodomethane	0.711	0.822	-15.6	109	0.00	7.22
26	iso-butyl alcohol	0.014	0.016	-14.3	109	-0.01	10.13
27	carbon disulfide	1.165	1.289	-10.6	99	0.00	7.33
28	1-chloropropane	0.027	0.032	-18.5	104	0.00	7.68
29	methylene chloride	0.566	0.663	-17.1	104	0.00	7.67
30	methyl acetate	20.000	25.819	True	Calc.	% Drift	-----
				-29.1#	133	0.00	7.46
31	methyl tert butyl ether	1.155	1.325	-14.7	111	0.00	7.95
32	trans-1,2-dichloroethene	0.516	0.594	-15.1	101	0.00	8.01
33	di-isopropyl ether	1.384	1.470	-6.2	101	0.00	8.51
34	ethyl tert-butyl ether	1.294	1.387	-7.2	102	0.00	8.98
35	2-butanone	0.040	0.049	-22.5#	113	0.00	9.31
36	1,1-dichloroethane	0.687	0.785	-14.3	104	0.00	8.59
37	chloroprene	0.464	0.515	-11.0	99	-0.01	8.68

66.9
6

Continuing Calibration Summary

Page 2 of 3

Job Number: JB37147

Sample: VY5790-CC5710

Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Lab FileID: Y134494.D

38	acrylonitrile	0.122	0.145	-18.9	114	0.00	8.04
39	vinyl acetate	0.058	0.067	-15.5	119	-0.01	8.57
40	ethyl acetate	0.049	0.057	-16.3	111	0.00	9.30
41	2,2-dichloropropane	0.528	0.596	-12.9	101	0.00	9.31
42	cis-1,2-dichloroethene	0.454	0.487	-7.3	100	0.00	9.33
43	propionitrile	0.047	0.058	-23.4#	122	0.00	9.45
44	bromochloromethane	0.291	0.325	-11.7	108	0.00	9.65
45	tetrahydrofuran	0.046	0.060	-30.4#	127	0.00	9.68
46	chloroform	0.735	0.790	-7.5	103	-0.01	9.69
47	tert-Butyl Formate	0.291	0.302	-3.8	97	0.00	9.70
48 S	dibromofluoromethane (s)	0.390	0.405	-3.8	97	-0.01	9.90
49 S	1,2-dichloroethane-d4 (s)	0.409	0.372	9.0	85	0.00	10.32
50	freon 113	0.202	0.262	-29.7#	110	0.00	6.87
51	methacrylonitrile	0.139	0.164	-18.0	113	-0.01	9.60
52	1,1,1-trichloroethane	0.559	0.620	-10.9	100	-0.01	9.92
53	Cyclohexane	0.485	0.478	1.4	84	-0.01	9.96
54	2,2,4-trimethylpentane	1.237	1.336	-8.0	103	-0.01	10.30
55	tert-amyl methyl ether	1.302	1.360	-4.5	104	-0.01	10.36
56 I	1,4-difluorobenzene	1.000	1.000	0.0	89	-0.01	10.73
57	epichlorohydrin	0.023	0.026	-13.0	102	0.00	12.00
58	n-butyl alcohol	0.008	0.009	-12.5	111	0.00	10.88
59	carbon tetrachloride	0.338	0.390	-15.4	100	0.00	10.10
60	1,1-dichloropropene	0.338	0.365	-8.0	94	0.00	10.09
61	hexane	0.282	0.338	-19.9	105	0.00	8.26
62	Tert Amyl Alcohol	0.033	0.020	39.4#	61	0.00	10.25
63	benzene	1.141	1.220	-6.9	99	0.00	10.36
64	heptane			-----NA-----			
65	isopropyl acetate	0.103	0.130	-26.2#	107	-0.01	10.26
66	1,2-dichloroethane	0.330	0.391	-18.5	108	0.00	10.41
67	trichloroethene	0.268	0.290	-8.2	96	-0.01	11.06
68	ethyl acrylate			-----NA-----			
69	2-nitropropane	0.085	0.079	7.1	90	0.00	11.87
70	2-chloroethyl vinyl ether	0.120	0.075	37.5#	57	0.00	11.85
71	methyl methacrylate	0.173	0.196	-13.3	109	0.00	11.32
72	1,2-dichloropropane	0.295	0.334	-13.2	107	-0.01	11.34
73	methylcyclohexane	0.367	0.424	-15.5	107	0.00	11.24
74	Tert-amyl ethyl ether	0.711	0.382	46.3#	49#	-0.01	11.17
75	dibromomethane	0.172	0.198	-15.1	109	0.00	11.51
76	bromodichloromethane	0.390	0.433	-11.0	105	-0.01	11.63
77	cis-1,3-dichloropropene	0.480	0.521	-8.5	104	0.00	12.07
78 S	toluene-d8 (s)	0.914	0.986	-7.9	94	0.00	12.33
79	4-methyl-2-pentanone	0.099	0.119	-20.2#	115	0.00	12.15
80	toluene	1.166	1.199	-2.8	96	0.00	12.40
81	3-methyl-1-butanol	0.008	0.009	-12.5	109	0.00	12.18
82	trans-1,3-dichloropropene	0.405	0.455	-12.3	106	0.00	12.62
83	ethyl methacrylate	0.352	0.368	-4.5	102	0.00	12.58
84	1,1,2-trichloroethane	0.210	0.230	-9.5	109	0.00	12.83
85	2-hexanone	0.094	0.106	-12.8	102	0.00	12.99
86 I	chlorobenzene-d5	1.000	1.000	0.0	88	0.00	13.82
87	tetrachloroethene	0.370	0.394	-6.5	95	0.00	12.96
88	1,3-dichloropropane	0.481	0.544	-13.1	107	0.00	13.01
89	butyl acetate	0.195	0.236	-21.0#	107	0.00	13.03
90	dibromochloromethane	0.372	0.444	-19.4	113	-0.01	13.27
91	1,2-dibromoethane	0.296	0.356	-20.3#	110	0.00	13.42
92	3,3-Dimethyl-1-Butanol	0.034	0.039	-14.7	105	0.00	13.15
93	chlorobenzene	0.965	0.992	-2.8	97	0.00	13.85
94	1,1,1,2-tetrachloroethane	0.358	0.402	-12.3	104	-0.01	13.91
95	ethylbenzene	1.523	1.562	-2.6	93	0.00	13.89

6.9.6
6

Continuing Calibration Summary

Job Number: JB37147

Sample: VY5790-CC5710

Account: AQTPAW Aquaterra Technologies, Inc.

Lab FileID: Y134494.D

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

96	m,p-xylene	0.617	0.595	3.6	91	0.00	13.99
97	o-xylene	1.260	1.257	0.2	93	0.00	14.40
98	styrene	1.029	1.012	1.7	92	0.00	14.42
99	bromoform	0.253	0.314	-24.1#	120	0.00	14.71
100	I 1,4-dichlorobenzene-d4	1.000	1.000	0.0	87	0.00	16.10
101	isopropylbenzene	2.503	2.723	-8.8	90	0.00	14.73
102	S 4-bromofluorobenzene (s)	0.793	0.791	0.3	84	0.00	14.95
103	bromobenzene	0.821	0.852	-3.8	98	0.00	15.15
104	cyclohexanone	0.021	0.104	-395.2#	476#	0.00	14.95
105	1,1,2,2-tetrachloroethane	0.718	0.859	-19.6	112	0.00	15.07
106	trans-1,4-dichloro-2-bute	0.179	0.203	-13.4	103	0.00	15.11
107	1,2,3-trichloropropane	0.170	0.213	-25.3#	114	0.00	15.15
108	n-propylbenzene	2.981	3.232	-8.4	90	0.00	15.13
109	4-Ethyltoluene			-----NA-----			
110	2-chlorotoluene	0.642	0.712	-10.9	95	0.00	15.29
111	4-chlorotoluene	1.957	2.068	-5.7	89	0.00	15.39
112	1,3,5-trimethylbenzene	2.144	2.327	-8.5	93	0.00	15.28
113	tert-butylbenzene	1.776	1.895	-6.7	89	0.00	15.62
114	pentachloroethane	0.509	0.588	-15.5	103	0.00	15.73
115	1,2,4-trimethylbenzene	2.216	2.349	-6.0	89	0.00	15.67
116	sec-butylbenzene	2.684	2.872	-7.0	88	0.00	15.83
117	1,3-dichlorobenzene	1.437	1.501	-4.5	93	0.00	16.05
118	p-isopropyltoluene	2.240	2.404	-7.3	88	0.00	15.95
119	1,4-dichlorobenzene	1.440	1.557	-8.1	92	0.00	16.13
120	1,2-dichlorobenzene	1.393	1.489	-6.9	97	0.00	16.52
121	n-butylbenzene	0.489	0.566	-15.7	96	0.00	16.36
122	p-Diethylbenzene			-----NA-----			
123	1,2-dibromo-3-chloropropene	0.137	0.190	-38.7#	122	0.00	17.31
124	1,3,5-Trichlorobenzene	1.086	1.241	-14.3	93	0.00	17.46
125	1,2,4-trichlorobenzene	0.960	1.141	-18.9	97	0.00	18.10
126	1,2,4,5-tetramethylbenzen			-----NA-----			
127	hexachlorobutadiene	0.545	0.680	-24.8#	100	0.00	18.19
128	naphthalene	1.888	2.457	-30.1#	107	0.00	18.39
129	1,2,3-trichlorobenzene	0.866	1.067	-23.2#	101	0.00	18.65
130	hexachloroethane	0.486	0.538	-10.7	96	0.00	16.75
131	Benzyl chloride	1.396	1.589	-13.8	99	0.00	16.25
<hr/>							

(#= Out of Range
Y132606.D MY5710.MSPCC's out = 0 CCC's out = 0
Wed May 29 15:54:57 2013 RPT16.9.6
6



GC/MS Volatiles

Raw Data

7

Quantitation Report (QT Reviewed)

Data Path : C:\MSDCHEM\1\DATA\
 Data File : Y134392.D
 Acq On : 19 May 2013 7:52 am
 Operator : ROBERTS
 Sample : JB37147-1
 Misc : MS48468,VY5787,5.7,,,1
 ALS Vial : 47 Sample Multiplier: 1

Quant Time: May 23 08:23:44 2013
 Quant Method : C:\MSDCHEM\1\METHODS\MY5710.M
 Quant Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 QLast Update : Tue May 07 15:14:28 2013
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Tert Butyl Alcohol-d9	7.64	65	34051	500.00	ug/L	0.00
4) pentafluorobenzene	9.82	168	108607	50.00	ug/L	0.00
56) 1,4-difluorobenzene	10.73	114	147448	50.00	ug/L	0.00
86) chlorobenzene-d5	13.82	117	116739	50.00	ug/L	0.00
100) 1,4-dichlorobenzene-d4	16.10	152	58503	50.00	ug/L	0.00

System Monitoring Compounds

48) dibromofluoromethane (s)	9.90	113	42746	50.49	ug/L	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	100.98%
49) 1,2-dichloroethane-d4 (s)	10.32	65	39827	44.87	ug/L	0.00
Spiked Amount	50.000	Range	70 - 122	Recovery	=	89.74%
78) toluene-d8 (s)	12.33	98	139804	51.89	ug/L	0.00
Spiked Amount	50.000	Range	81 - 127	Recovery	=	103.78%
102) 4-bromofluorobenzene (s)	14.96	95	48400	52.16	ug/L	0.00
Spiked Amount	50.000	Range	66 - 132	Recovery	=	104.32%

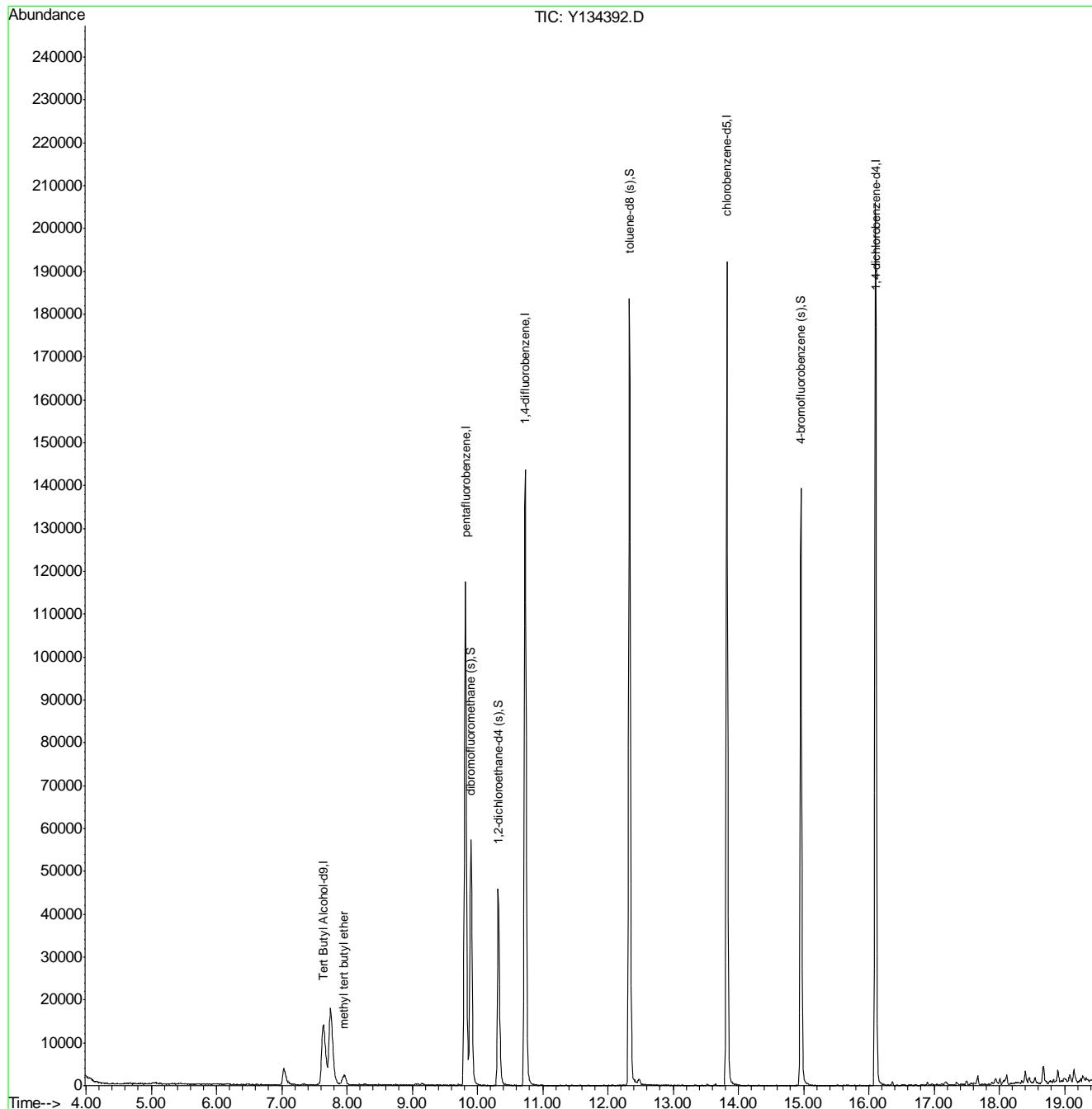
Target Compounds				Qvalue
31) methyl tert butyl ether	7.95	73	5294	2.11 ug/L 91

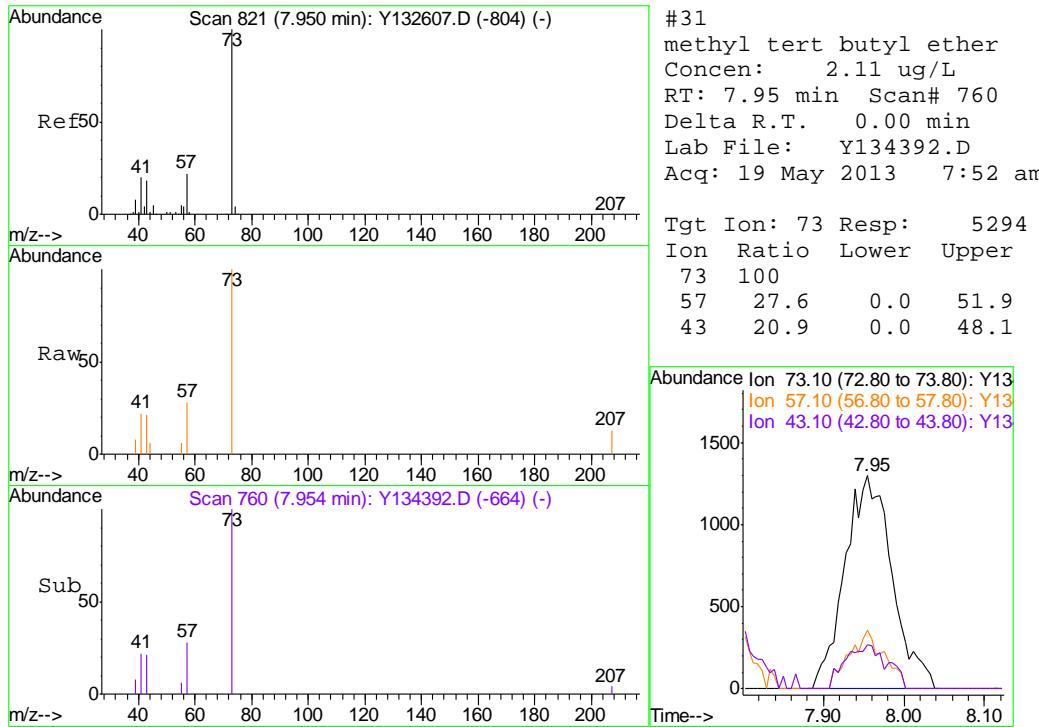
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\MSDCHEM\1\DATA\
 Data File : Y134392.D
 Acq On : 19 May 2013 7:52 am
 Operator : ROBERTS
 Sample : JB37147-1
 Misc : MS48468,VY5787,5.7,,,1
 ALS Vial : 47 Sample Multiplier: 1

Quant Time: May 23 08:23:44 2013
 Quant Method : C:\MSDCHEM\1\METHODS\MY5710.M
 Quant Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 QLast Update : Tue May 07 15:14:28 2013
 Response via : Initial Calibration





Quantitation Report (QT Reviewed)

Data Path : C:\MSDCHEM\1\DATA\
 Data File : Y134393.D
 Acq On : 19 May 2013 8:21 am
 Operator : ROBERTS
 Sample : JB37147-2
 Misc : MS48468,VY5787,9.6,,,1
 ALS Vial : 48 Sample Multiplier: 1

Quant Time: May 23 08:23:57 2013
 Quant Method : C:\MSDCHEM\1\METHODS\MY5710.M
 Quant Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 QLast Update : Tue May 07 15:14:28 2013
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Tert Butyl Alcohol-d9	7.64	65	37717	500.00	ug/L	0.00
4) pentafluorobenzene	9.82	168	107498	50.00	ug/L	0.00
56) 1,4-difluorobenzene	10.73	114	143676	50.00	ug/L	0.00
86) chlorobenzene-d5	13.82	117	112840	50.00	ug/L	0.00
100) 1,4-dichlorobenzene-d4	16.10	152	55201	50.00	ug/L	0.00

System Monitoring Compounds

48) dibromofluoromethane (s)	9.90	113	34324	40.96	ug/L	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	81.92%
49) 1,2-dichloroethane-d4 (s)	10.32	65	38808	44.18	ug/L	0.00
Spiked Amount	50.000	Range	70 - 122	Recovery	=	88.36%
78) toluene-d8 (s)	12.33	98	134743	51.32	ug/L	0.00
Spiked Amount	50.000	Range	81 - 127	Recovery	=	102.64%
102) 4-bromofluorobenzene (s)	14.96	95	45727	52.22	ug/L	0.00
Spiked Amount	50.000	Range	66 - 132	Recovery	=	104.44%

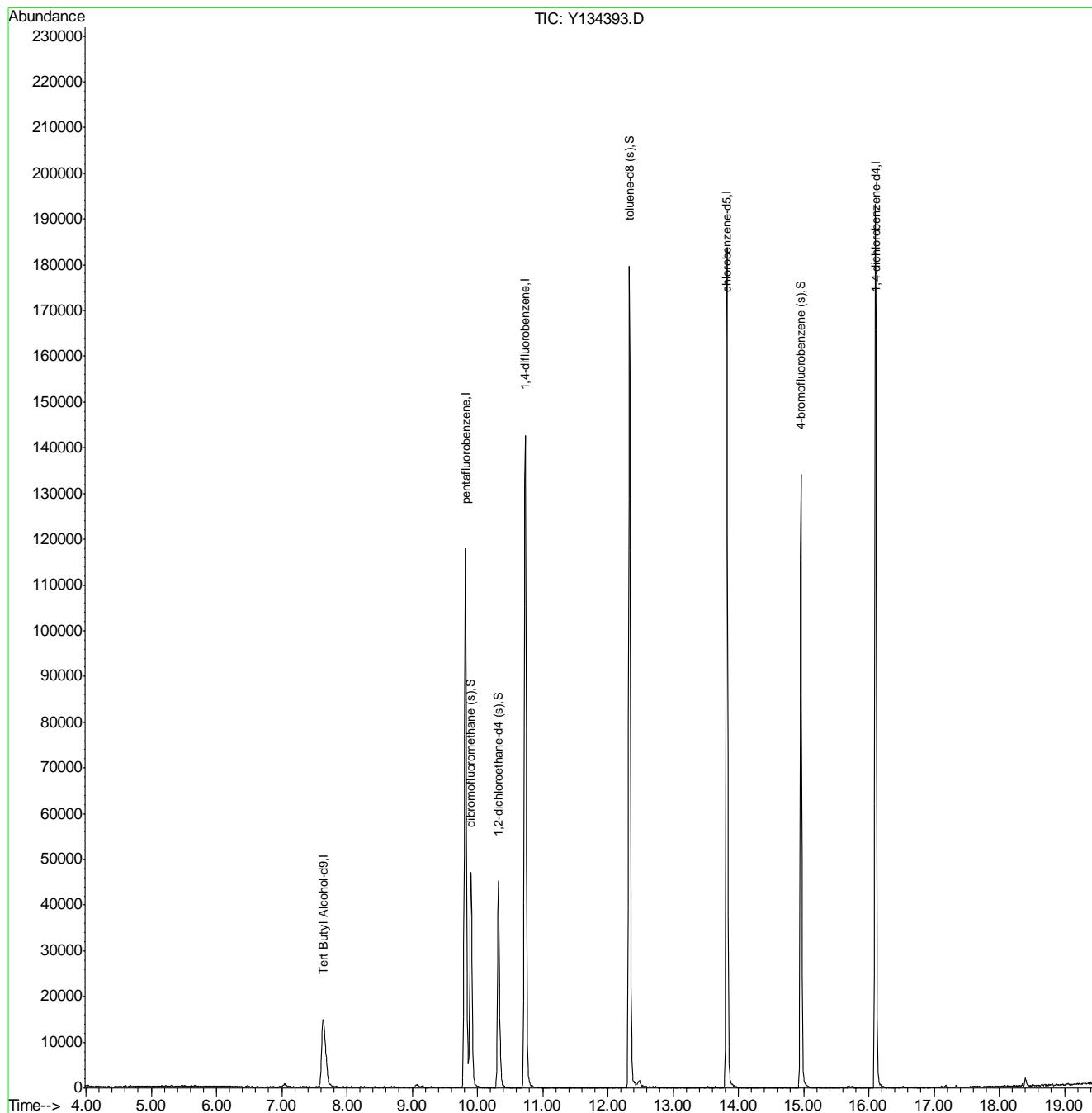
Target Compounds

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\MSDCHEM\1\DATA\
 Data File : Y134393.D
 Acq On : 19 May 2013 8:21 am
 Operator : ROBERTS
 Sample : JB37147-2
 Misc : MS48468,VY5787,9.6,,,1
 ALS Vial : 48 Sample Multiplier: 1

Quant Time: May 23 08:23:57 2013
 Quant Method : C:\MSDCHEM\1\METHODS\MY5710.M
 Quant Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 QLast Update : Tue May 07 15:14:28 2013
 Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\MSDCHEM\1\DATA\
 Data File : Y134394.D
 Acq On : 19 May 2013 8:49 am
 Operator : ROBERTS
 Sample : JB37147-3
 Misc : MS48468,VY5787,6.1,,,1
 ALS Vial : 49 Sample Multiplier: 1

Quant Time: May 23 08:24:10 2013
 Quant Method : C:\MSDCHEM\1\METHODS\MY5710.M
 Quant Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 QLast Update : Tue May 07 15:14:28 2013
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Tert Butyl Alcohol-d9	7.63	65	31334	500.00	ug/L	0.00
4) pentafluorobenzene	9.82	168	104691	50.00	ug/L	0.00
56) 1,4-difluorobenzene	10.73	114	142870	50.00	ug/L	0.00
86) chlorobenzene-d5	13.82	117	112735	50.00	ug/L	0.00
100) 1,4-dichlorobenzene-d4	16.10	152	55697	50.00	ug/L	0.00

System Monitoring Compounds

48) dibromofluoromethane (s)	9.90	113	41970	51.43	ug/L	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	102.86%
49) 1,2-dichloroethane-d4 (s)	10.32	65	38614	45.13	ug/L	0.00
Spiked Amount	50.000	Range	70 - 122	Recovery	=	90.26%
78) toluene-d8 (s)	12.33	98	134897	51.67	ug/L	0.00
Spiked Amount	50.000	Range	81 - 127	Recovery	=	103.34%
102) 4-bromofluorobenzene (s)	14.96	95	46554	52.70	ug/L	0.00
Spiked Amount	50.000	Range	66 - 132	Recovery	=	105.40%

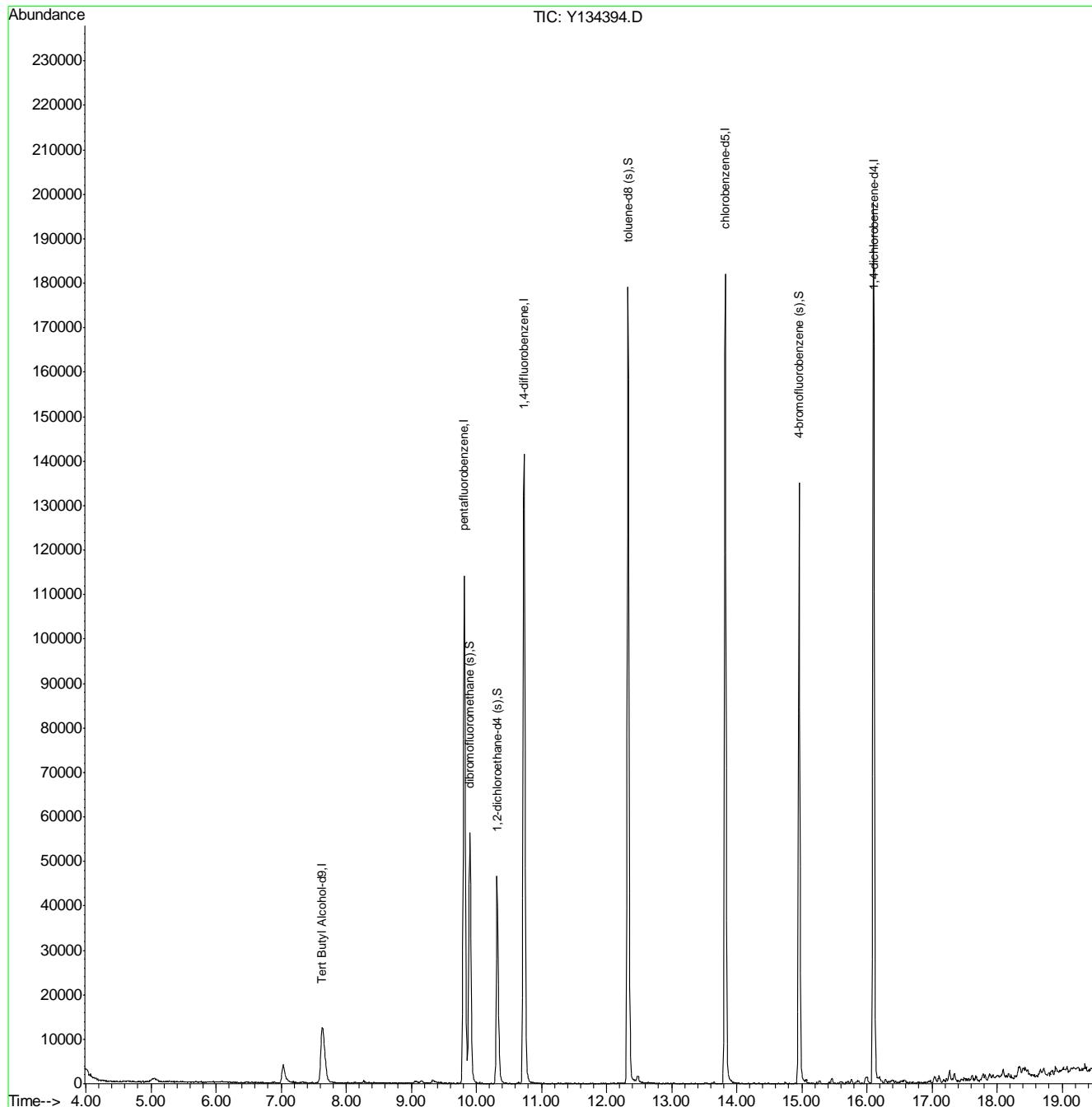
Target Compounds	Qvalue
(#) = qualifier out of range (m) = manual integration (+) = signals summed	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\MSDCHEM\1\DATA\
 Data File : Y134394.D
 Acq On : 19 May 2013 8:49 am
 Operator : ROBERTS
 Sample : JB37147-3
 Misc : MS48468,VY5787,6.1,,,1
 ALS Vial : 49 Sample Multiplier: 1

Quant Time: May 23 08:24:10 2013
 Quant Method : C:\MSDCHEM\1\METHODS\MY5710.M
 Quant Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 QLast Update : Tue May 07 15:14:28 2013
 Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\MSDCHEM\1\DATA\
 Data File : Y134458.D
 Acq On : 21 May 2013 6:59 pm
 Operator : ROBERTS
 Sample : JB37147-4
 Misc : MS48468,VY5790,6.3,,,1
 ALS Vial : 15 Sample Multiplier: 1

Quant Time: May 23 08:47:35 2013
 Quant Method : C:\MSDCHEM\1\METHODS\MY5710.M
 Quant Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 QLast Update : Tue May 07 15:14:28 2013
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Tert Butyl Alcohol-d9	7.64	65	38144	500.00	ug/L	0.00
4) pentafluorobenzene	9.82	168	95341	50.00	ug/L	0.00
56) 1,4-difluorobenzene	10.73	114	134902	50.00	ug/L	0.00
86) chlorobenzene-d5	13.82	117	108020	50.00	ug/L	0.00
100) 1,4-dichlorobenzene-d4	16.10	152	56254	50.00	ug/L	0.00

System Monitoring Compounds

48) dibromofluoromethane (s)	9.90	113	40076	53.92	ug/L	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	107.84%
49) 1,2-dichloroethane-d4 (s)	10.32	65	41127	52.79	ug/L	0.00
Spiked Amount	50.000	Range	70 - 122	Recovery	=	105.58%
78) toluene-d8 (s)	12.33	98	132550	53.77	ug/L	0.00
Spiked Amount	50.000	Range	81 - 127	Recovery	=	107.54%
102) 4-bromofluorobenzene (s)	14.96	95	47592	53.34	ug/L	0.00
Spiked Amount	50.000	Range	66 - 132	Recovery	=	106.68%

Target Compounds

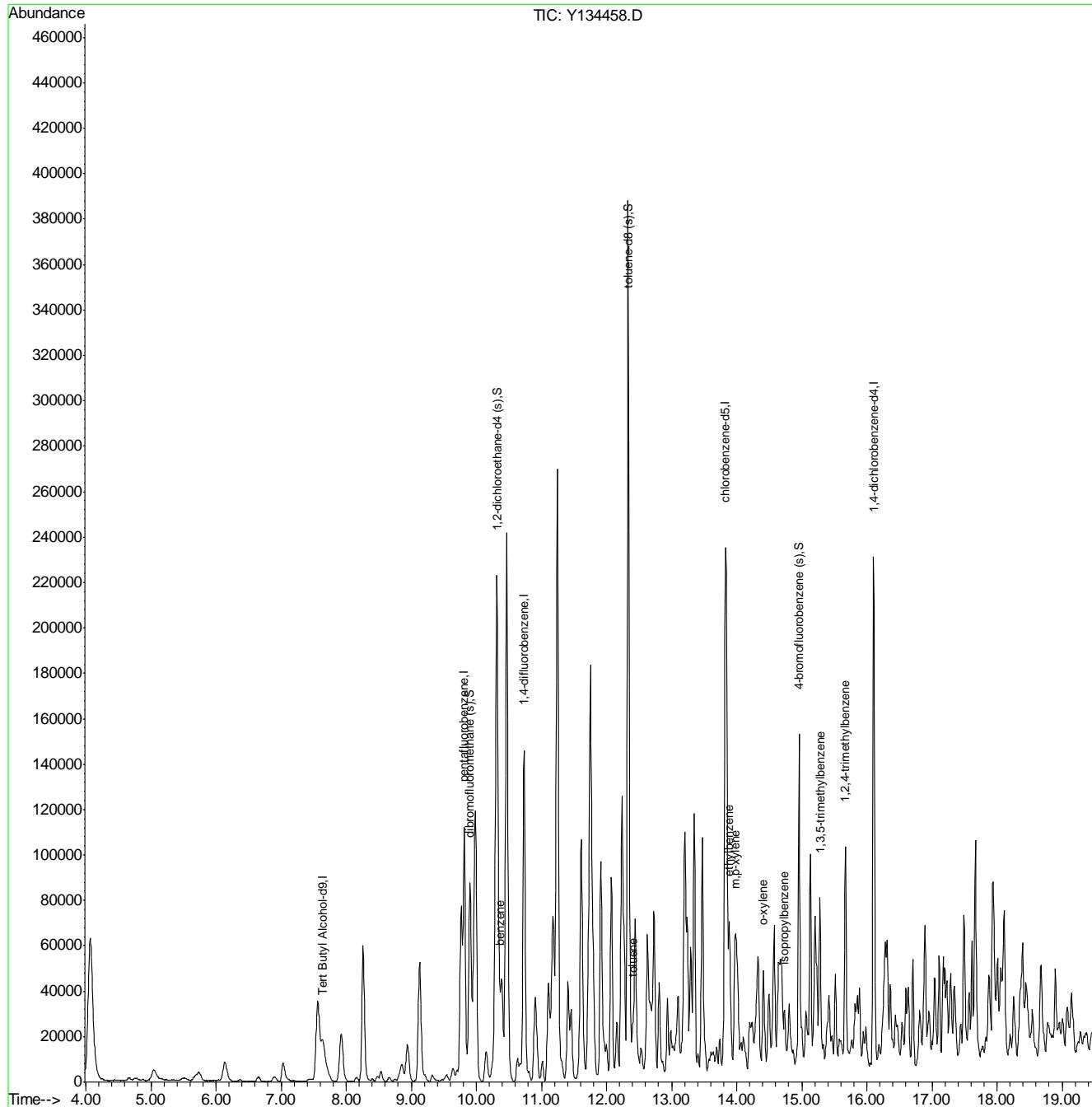
				QValue
63) benzene	10.37	78	17354	5.64 ug/L 97
80) toluene	12.41	91	3047	0.97 ug/L 87
95) ethylbenzene	13.89	91	19243	5.85 ug/L 96
96) m,p-xylene	13.99	106	11901	8.93 ug/L 95
97) o-xylene	14.40	91	16064	5.90 ug/L 99
101) isopropylbenzene	14.73	105	13929	4.95 ug/L 97
112) 1,3,5-trimethylbenzene	15.28	105	30465	12.63 ug/L 96
115) 1,2,4-trimethylbenzene	15.67	105	52377	21.01 ug/L 96

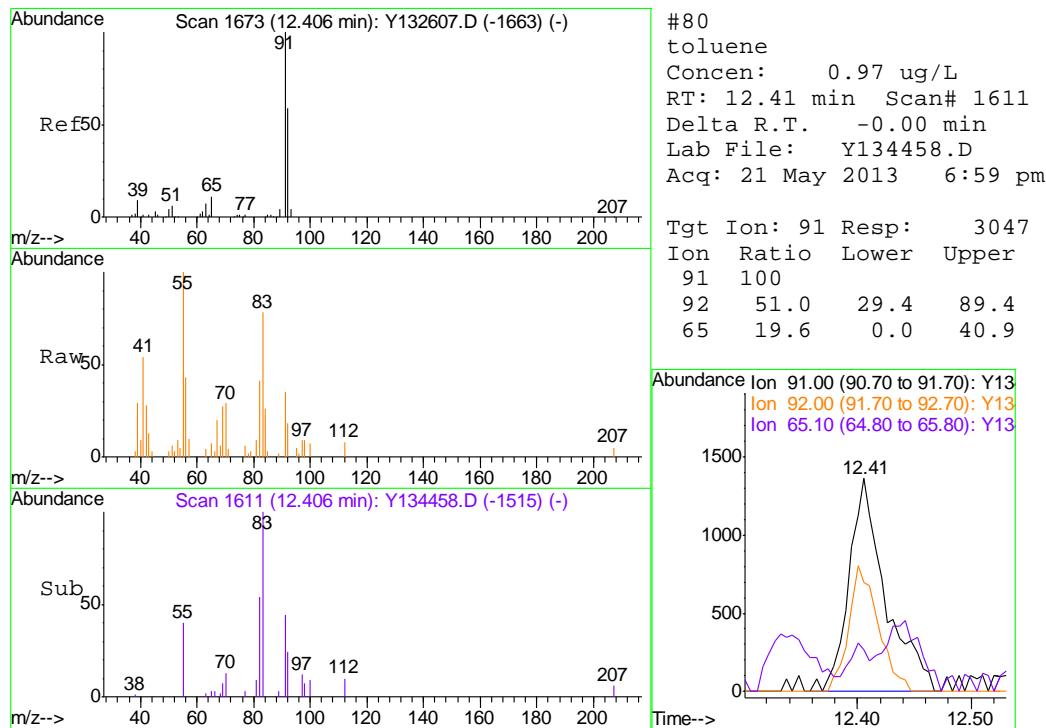
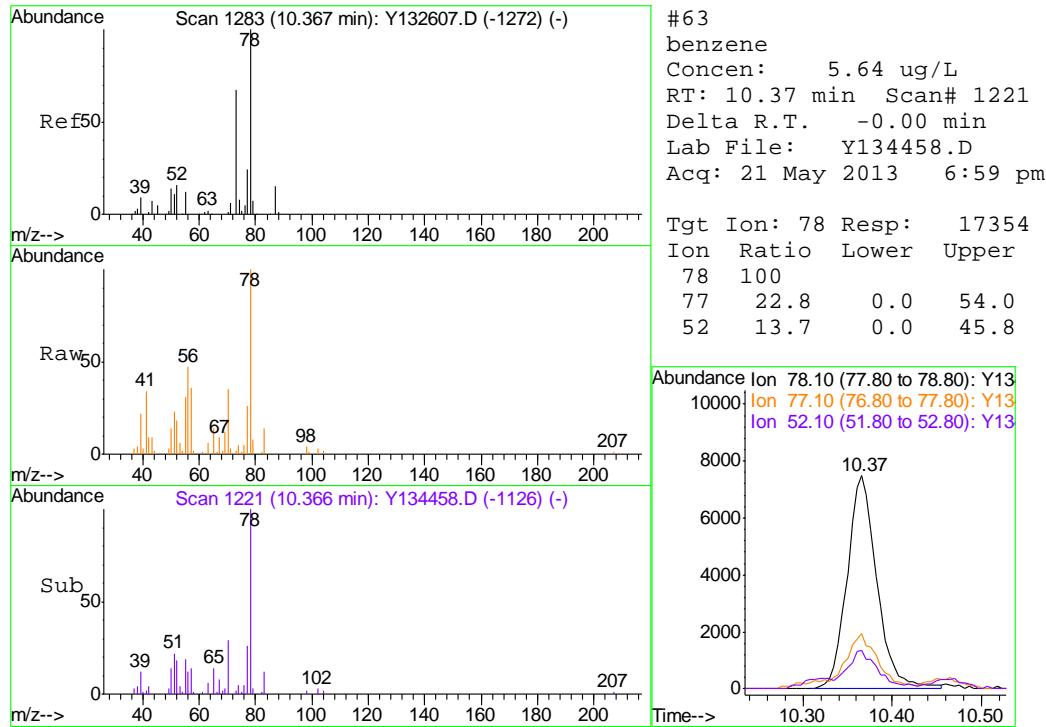
(#) = qualifier out of range (m) = manual integration (+) = signals summed

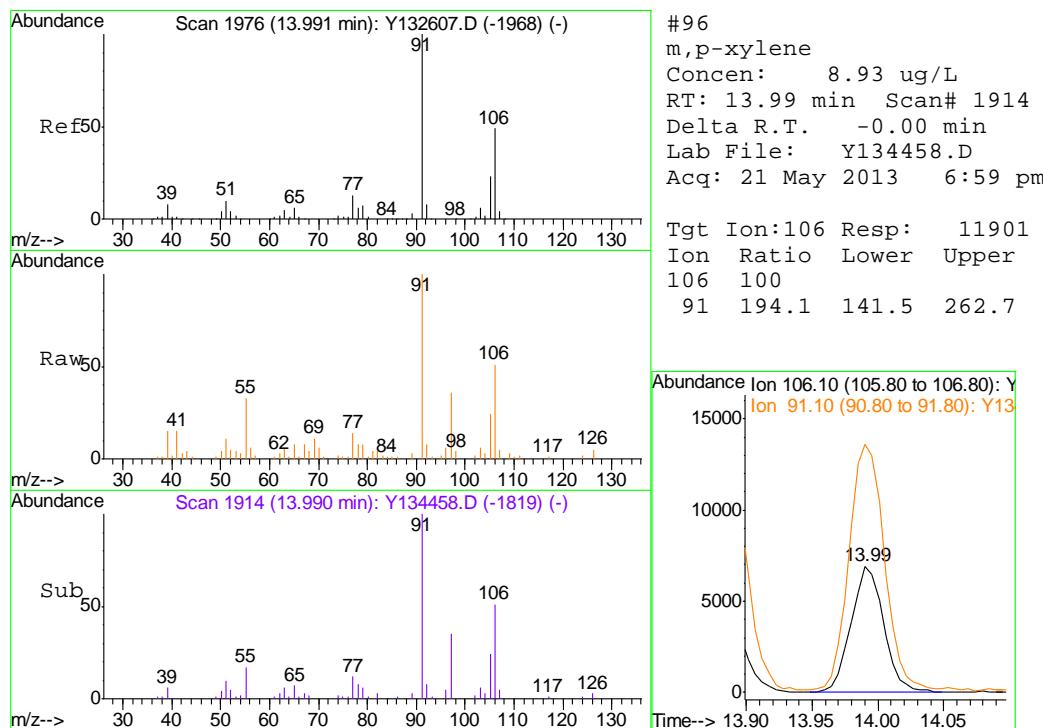
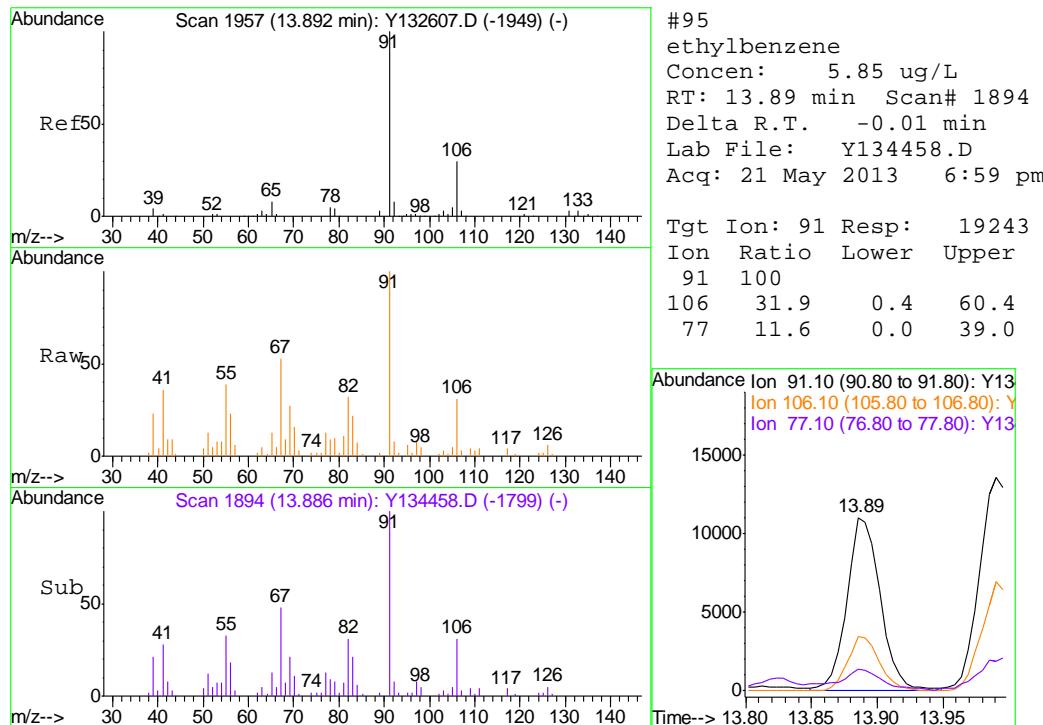
Quantitation Report (QT Reviewed)

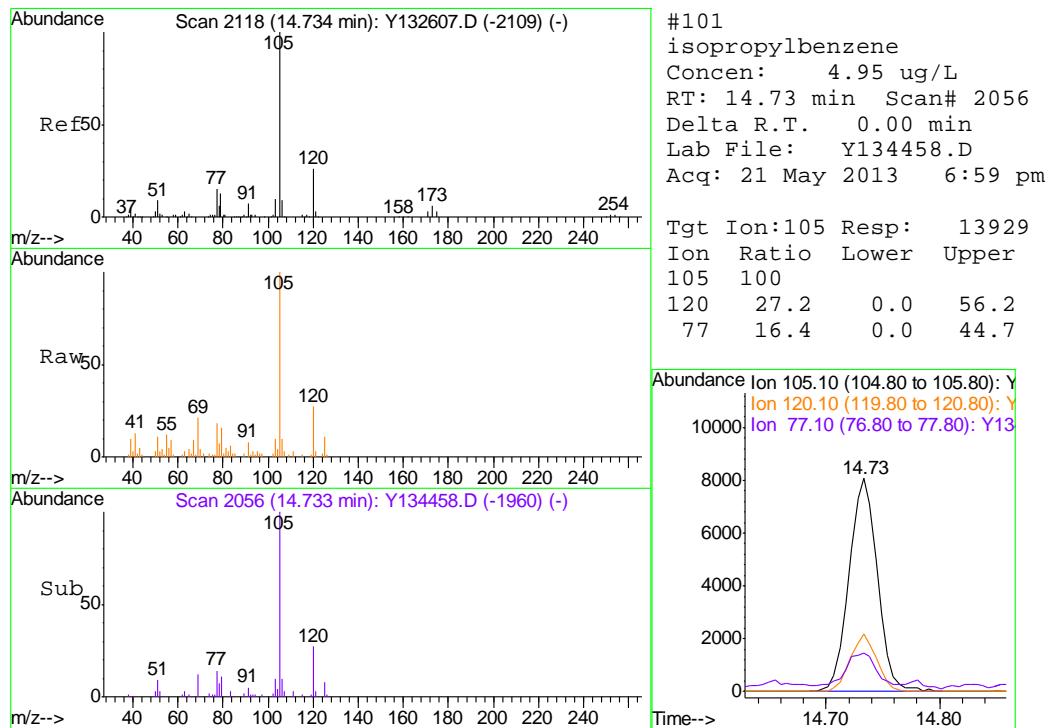
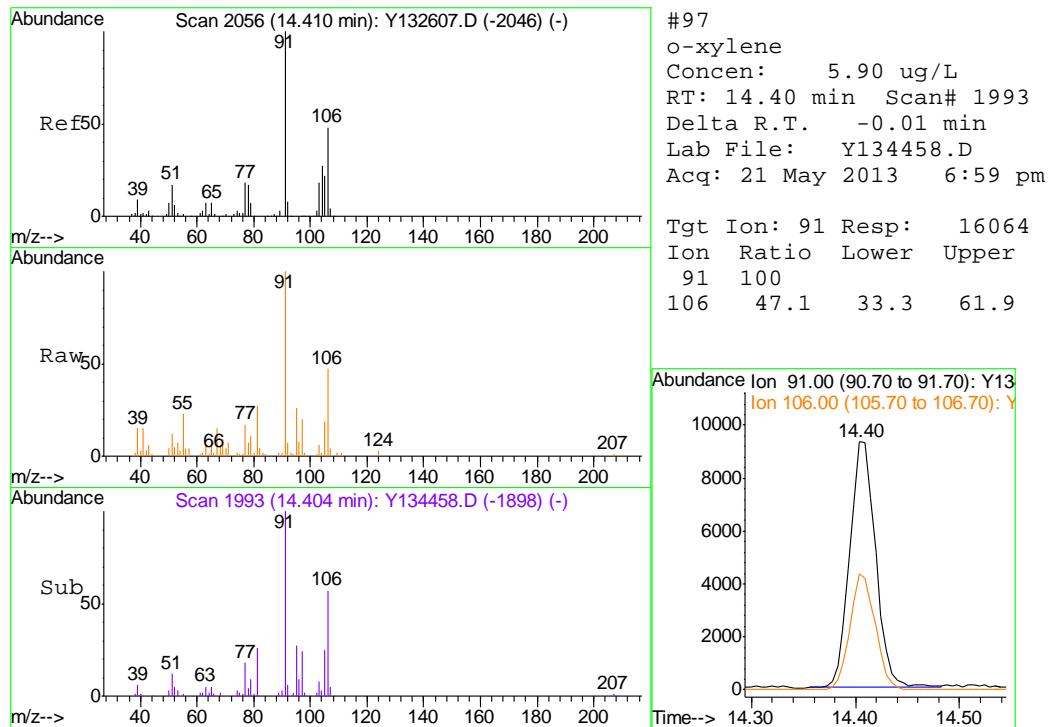
Data Path : C:\MSDCHEM\1\DATA\
 Data File : Y134458.D
 Acq On : 21 May 2013 6:59 pm
 Operator : ROBERTS
 Sample : JB37147-4
 Misc : MS48468,VY5790,6.3,,,1
 ALS Vial : 15 Sample Multiplier: 1

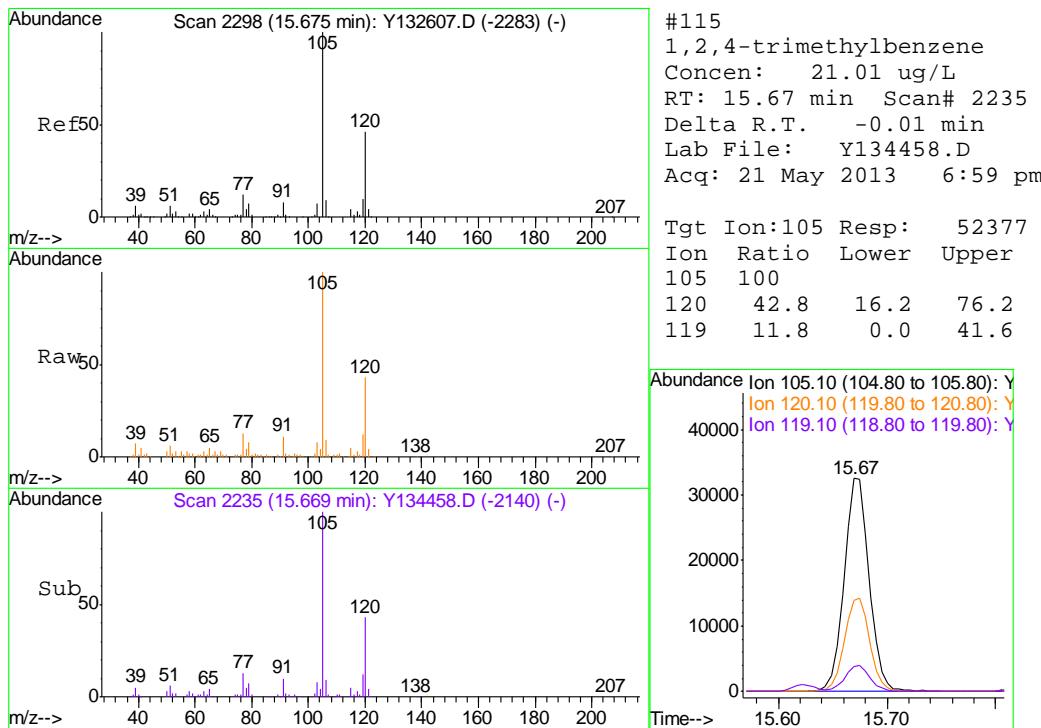
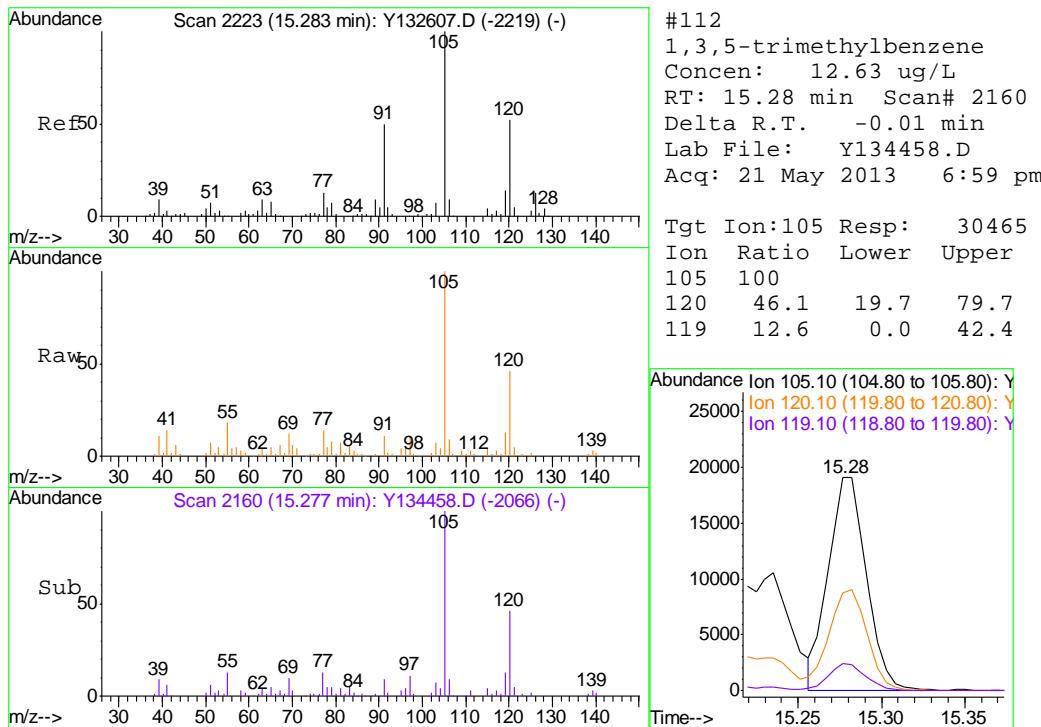
Quant Time: May 23 08:47:35 2013
 Quant Method : C:\MSDCHEM\1\METHODS\MY5710.M
 Quant Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 QLast Update : Tue May 07 15:14:28 2013
 Response via : Initial Calibration











Quantitation Report (QT/LSC Reviewed)

Data Path : C:\MSDChem\1\DATA\
 Data File : Y134374.D
 Acq On : 18 May 2013 11:15 pm
 Operator : ROBERTS
 Sample : MB
 Misc : MS48482,VY5787,5.0,,,1
 ALS Vial : 29 Sample Multiplier: 1

Quant Time: May 21 15:40:49 2013
 Quant Method : C:\MSDCHEM\1\METHODS\MY5710.M
 Quant Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 QLast Update : Tue May 07 15:14:28 2013
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Tert Butyl Alcohol-d9	7.64	65	33220	500.00	ug/L	0.00
4) pentafluorobenzene	9.81	168	98275	50.00	ug/L	0.00
56) 1,4-difluorobenzene	10.73	114	133875	50.00	ug/L	0.00
86) chlorobenzene-d5	13.82	117	101740	50.00	ug/L	0.00
100) 1,4-dichlorobenzene-d4	16.10	152	48911	50.00	ug/L	0.00

System Monitoring Compounds						
48) dibromofluoromethane (s)	9.90	113	38077	49.70	ug/L	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	99.40%
49) 1,2-dichloroethane-d4 (s)	10.32	65	35842	44.63	ug/L	0.00
Spiked Amount	50.000	Range	70 - 122	Recovery	=	89.26%
78) toluene-d8 (s)	12.33	98	124155	50.75	ug/L	0.00
Spiked Amount	50.000	Range	81 - 127	Recovery	=	101.50%
102) 4-bromofluorobenzene (s)	14.96	95	41155	53.05	ug/L	0.00
Spiked Amount	50.000	Range	66 - 132	Recovery	=	106.10%

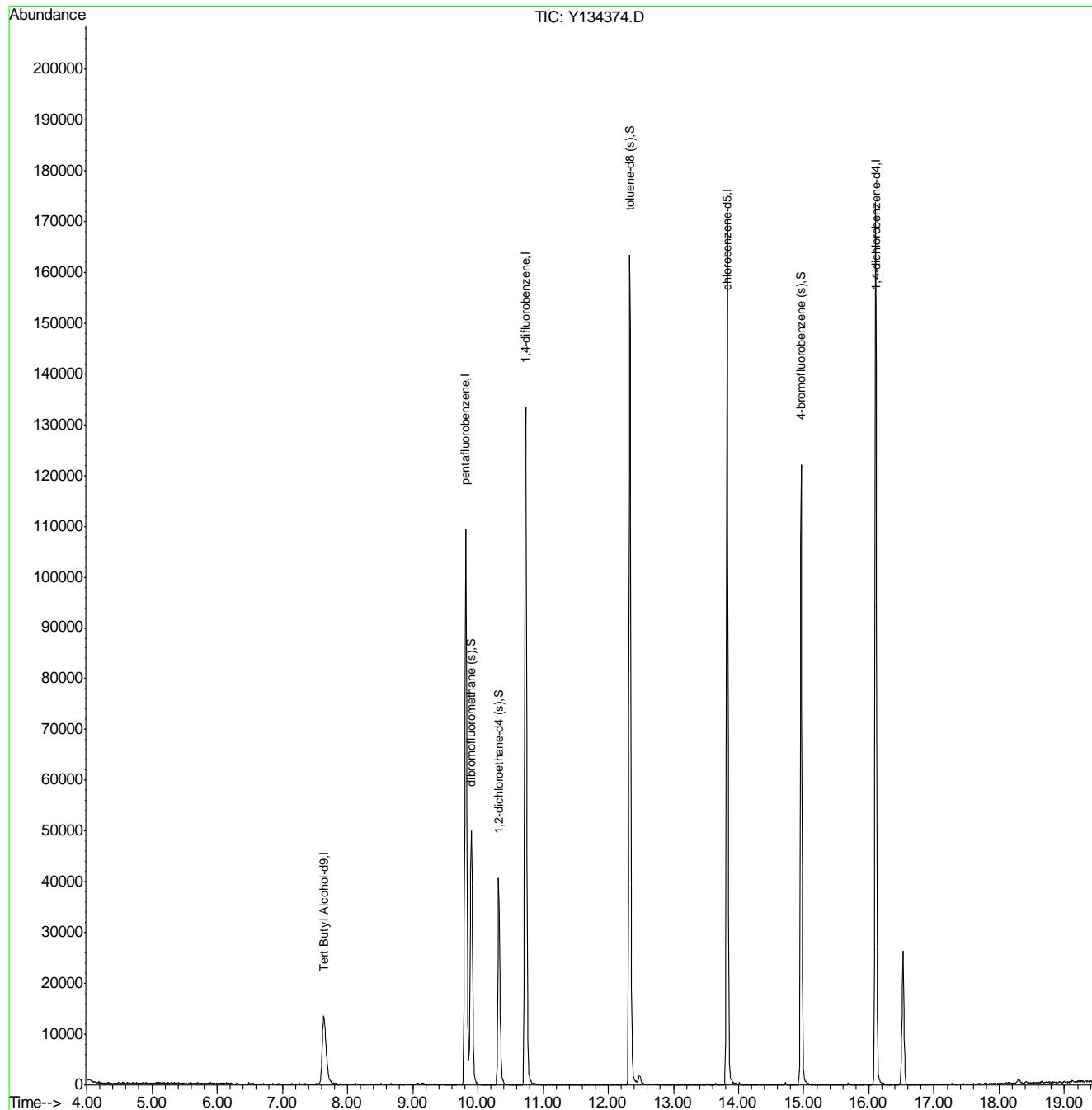
Target Compounds	Qvalue
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(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT/LSC Reviewed)

Data Path : C:\MSDCHEM\1\DATA\
 Data File : Y134374.D
 Acq On : 18 May 2013 11:15 pm
 Operator : ROBERTS
 Sample : MB
 Misc : MS48482,VY5787,5.0,,,1
 ALS Vial : 29 Sample Multiplier: 1

Quant Time: May 21 15:40:49 2013
 Quant Method : C:\MSDCHEM\1\METHODS\MY5710.M
 Quant Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 QLast Update : Tue May 07 15:14:28 2013
 Response via : Initial Calibration



Quantitation Report (QT/LSC Reviewed)

Data Path : C:\MSDCHEM\1\DATA\
 Data File : Y134446.D
 Acq On : 21 May 2013 12:31 pm
 Operator : ROBERTS
 Sample : MB
 Misc : MS48559,VY5790,5.0,,,1
 ALS Vial : 3 Sample Multiplier: 1

Quant Time: May 22 15:31:57 2013
 Quant Method : C:\MSDCHEM\1\METHODS\MY5710.M
 Quant Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 QLast Update : Tue May 07 15:14:28 2013
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Tert Butyl Alcohol-d9	7.64	65	41674	500.00	ug/L	0.00
4) pentafluorobenzene	9.81	168	105547	50.00	ug/L	0.00
56) 1,4-difluorobenzene	10.73	114	145367	50.00	ug/L	-0.01
86) chlorobenzene-d5	13.82	117	114783	50.00	ug/L	0.00
100) 1,4-dichlorobenzene-d4	16.10	152	58885	50.00	ug/L	0.00

System Monitoring Compounds						
48) dibromofluoromethane (s)	9.89	113	41460	50.39	ug/L	-0.01
Spiked Amount	50.000	Range	70 - 130	Recovery	=	100.78%
49) 1,2-dichloroethane-d4 (s)	10.32	65	39471	45.76	ug/L	0.00
Spiked Amount	50.000	Range	70 - 122	Recovery	=	91.52%
78) toluene-d8 (s)	12.33	98	143155	53.89	ug/L	0.00
Spiked Amount	50.000	Range	81 - 127	Recovery	=	107.78%
102) 4-bromofluorobenzene (s)	14.96	95	46951	50.27	ug/L	0.00
Spiked Amount	50.000	Range	66 - 132	Recovery	=	100.54%

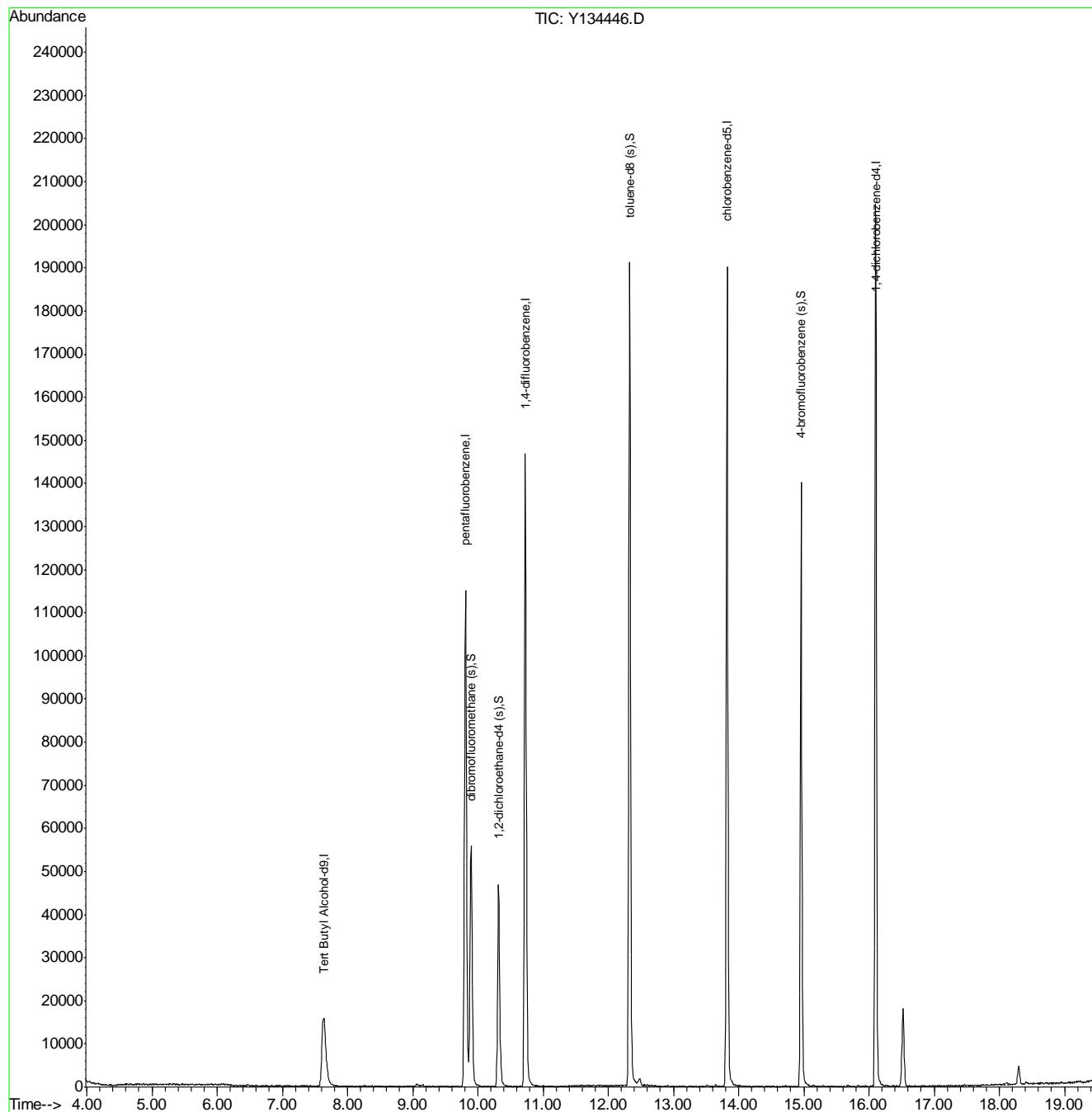
Target Compounds	Qvalue
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(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT/LSC Reviewed)

Data Path : C:\MSDCHEM\1\DATA\
 Data File : Y134446.D
 Acq On : 21 May 2013 12:31 pm
 Operator : ROBERTS
 Sample : MB
 Misc : MS48559,VY5790,5.0,,,1
 ALS Vial : 3 Sample Multiplier: 1

Quant Time: May 22 15:31:57 2013
 Quant Method : C:\MSDCHEM\1\METHODS\MY5710.M
 Quant Title : Method SW846 8260B, ZB624 60m x 0.25mm x 1.4um
 QLast Update : Tue May 07 15:14:28 2013
 Response via : Initial Calibration





Misc. Forms

Custody Documents and Other Forms

(Accutest Labs of New England, Inc.)

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Includes the following where applicable:

- Chain of Custody
- Sample Tracking Chronicle
- Internal Chain of Custody



CHAIN OF CUSTODY

PAGE ___ OF ___

2235 Route 130, Dayton, NJ 08810
 TEL: 732-329-0200 FAX: 732-329-3480
www.accutest.com

Client / Reporting Information		Project Information		FED-EX Tracking #				Bottle Order Control #										
Company Name: Accutest Laboratories		Project Name: Marcus Hook Refinery		Accutest Quote #				Accutest Job # JB37147										
Street Address 2235 Route 130		Street		Requested Analysis (see TEST CODE sheet)														
City Dayton State NJ Zip 08810		City State		Matrix Codes														
Project Contact Kristin Beebe		E-mail Project #		Billing Information (if different from Report to)														
Phone # 732-355-4559		Fax #		Company Name														
Sampler(s) Name(s)		Phone		Client Purchase Order #														
				City State Zip														
Project Manager		Attention:																
Accutest Sample #	Field ID / Point of Collection	Collection			Matrix	# of bottles	Number of preserved Bottles					%SOL	V8011EDB	B3270SL	PB	METDIG	LAB USE ONLY	
		Date	Time	Sampled by			HCl	NaOH	HNCO	H2SO4	ROH							Di Water
1		5/15/2013	12:00		Soil	2			X				X	X	X	X	X	
2		5/15/2013	9:14		Soil	2			X				X	X	X	X	X	
3		5/15/2013	14:00		Soil	2			X				X	X	X	X	X	
4		5/15/2013	10:55		Soil	2			X				X	X	X	X	X	
																		13E
Turnaround Time (Business days)		Data Deliverable Information											Comments / Special Instructions					
Approved By (Accutest PM): / Date:		<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> NYASP Category A <input type="checkbox"/> NYASP Category B <input type="checkbox"/> FULLT1 (Level 3+4) <input checked="" type="checkbox"/> NJ Reduced <input type="checkbox"/> State Forms <input type="checkbox"/> EDD Format <input type="checkbox"/> Commercial "C" <input type="checkbox"/> Other											Please send 300ml jar and 60ml jar to ALNE only. Methanol kits to remain here for analysis.					
Emergency & Rush T/A Data Available VIA LabLink		Commercial "A" = Results Only Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data																
Sample Custody must be documented below each time samples change possession, including courier delivery.																		
1	Relinquished by Sampler	Date TIR: 5-16-13 1700	Received By: 1 FED EX	Relinquished By: 2	Date Time: 5-17-13 02	Received By: Brennah												
3	Relinquished by Sampler	Date Time: 3	Received By: 4	Relinquished By: 4	Date Time: 4	Received By: 4												
5	Relinquished by:	Date Time: 5	Received By: 5	Custody Seal #: 6/11	<input type="checkbox"/> Intact <input type="checkbox"/> Not intact	Preserved where applicable	On Ice +	Cooler Temp 0,900										
6/12																		

JB37147: Chain of Custody
Page 1 of 3
Accutest Labs of New England, Inc.



Accutest Laboratories Sample Receipt Summary

Accutest Job Number: JB37147

Client: ACNJ

Immediate Client Services Action Required: Yes

Date / Time Received: 5/17/2013 9:30

Delivery Method: FedEx

Project: MARCUS HOOK

No. Coolers: 1 Airbill #'s:

Cooler SecurityY or NY or N

- | | | | | | |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Cooler TemperatureY or N

- | | | |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | Infrared gun | |
| 3. Cooler media: | Ice (bag) | |

Quality Control PreservationY N N/A

- | | | |
|---------------------------------|-------------------------------------|--------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Trip Blank listed on COC: | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Samples preserved properly: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. VOCs headspace free: | <input type="checkbox"/> | <input type="checkbox"/> |

Comments

-bot #2 was not received. Only the 300ml bot.

Sample Integrity - DocumentationY N

- | | | |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Sample Integrity - ConditionY N

- | | | |
|----------------------------------|-------------------------------------|-------------------------------------|
| 1. Sample rec'd within HT: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Condition of sample: | Intact | |

Sample Integrity - InstructionsY N N/A

- | | | |
|---|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Bottles received for unspecified tests | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Sufficient volume rec'd for analysis: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. Compositing instructions clear: | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Filtering instructions clear: | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Accutest Laboratories
V:508.481.6200495 Technology Center West, Bldg One
F: 508.481.7753Marlborough, MA
www.accutest.com

8.1

8

JB37147: Chain of Custody**Page 2 of 3**



Sample Receipt Summary - Problem Resolution

Accutest Job Number: JB37147

CSR: Jeremy Vienneau

Response Date: 5/22/2013

Response: 2 oz jars were sent by ALNJ. See COC.

8.1

8

Accutest Laboratories
V:508.481.6200

495 Technology Center West, Bldg One
F: 508.481.7753

Marlborough, MA
www.accutest.com

JB37147: Chain of Custody
Page 3 of 3

Internal Sample Tracking Chronicle

Accutest New Jersey

Job No: JB37147

AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA
Project No: AQTPAW56417

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JB37147-1	Collected: 15-MAY-13 12:00 By: LM	Received: 15-MAY-13 By:				
	AOI-5_MW-441_8-10'_51513					
JB37147-1	SM21 2540 B MOD.	20-MAY-13	HS			%SOL
JB37147-1	SW846 6010C	23-MAY-13 20:07	EAL	22-MAY-13 DA		PB
JB37147-1	SW846 8011	24-MAY-13 16:37	AP	23-MAY-13 AF		V8011EDB
JB37147-1	SW846 8270C	29-MAY-13 18:26	KR	25-MAY-13 BJ		B8270SL
JB37147-2	Collected: 15-MAY-13 09:14 By: LM	Received: 15-MAY-13 By:				
	AOI-5_MW-441_0-2'_51513					
JB37147-2	SM21 2540 B MOD.	20-MAY-13	HS			%SOL
JB37147-2	SW846 6010C	24-MAY-13 14:46	EAL	22-MAY-13 DA		PB
JB37147-2	SW846 8011	24-MAY-13 17:01	AP	23-MAY-13 AF		V8011EDB
JB37147-2	SW846 8270C	29-MAY-13 18:49	KR	25-MAY-13 BJ		B8270SL
JB37147-3	Collected: 15-MAY-13 14:00 By: LM	Received: 15-MAY-13 By:				
	AOI-5_MW-449_2-2'_51513					
JB37147-3	SM21 2540 B MOD.	20-MAY-13	HS			%SOL
JB37147-3	SW846 6010C	23-MAY-13 20:11	EAL	22-MAY-13 DA		PB
JB37147-3	SW846 8011	24-MAY-13 17:25	AP	23-MAY-13 AF		V8011EDB
JB37147-3	SW846 8270C	29-MAY-13 19:12	KR	25-MAY-13 BJ		B8270SL
JB37147-4	Collected: 15-MAY-13 10:55 By: LM	Received: 15-MAY-13 By:				
	AOI-5_MW-445_3-3.5'_51513					
JB37147-4	SM21 2540 B MOD.	20-MAY-13	HS			%SOL
JB37147-4	SW846 6010C	23-MAY-13 20:15	EAL	22-MAY-13 DA		PB
JB37147-4	SW846 8011	24-MAY-13 17:48	AP	23-MAY-13 AF		V8011EDB
JB37147-4	SW846 8270C	29-MAY-13 19:34	KR	25-MAY-13 BJ		B8270SL

Accutest Internal Chain of Custody

Page 1 of 1

Job Number: JB37147
Account: ALNJ Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA
Received: 05/15/13

Sample/Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JB37147-1.1	Walk In Ref #9	Mehdi Abdolrahim	05/20/13 10:31	Retrieve from Storage
JB37147-1.1	Mehdi Abdolrahim	Walk In Ref #9	05/20/13 12:42	Return to Storage
JB37147-1.1	Walk In Ref #9	Dorina Antonovici	05/22/13 14:07	Retrieve from Storage
JB37147-1.1	Dorina Antonovici	Walk In Ref #9	05/22/13 18:02	Return to Storage
JB37147-1.1	Walk In Ref #9	Amirhossein Farvardin	05/23/13 17:06	Retrieve from Storage
JB37147-1.1	Amirhossein Farvardin	Walk In Ref #9	05/23/13 22:29	Return to Storage
JB37147-1.2	Walk In Ref #9	Chris Cataldo	05/25/13 15:53	Retrieve from Storage
JB37147-1.2	Chris Cataldo	Walk In Ref #9	05/25/13 15:54	Return to Storage
JB37147-2.1	Walk In Ref #9	Mehdi Abdolrahim	05/20/13 10:31	Retrieve from Storage
JB37147-2.1	Mehdi Abdolrahim	Walk In Ref #9	05/20/13 12:42	Return to Storage
JB37147-2.1	Walk In Ref #9	Dorina Antonovici	05/22/13 14:07	Retrieve from Storage
JB37147-2.1	Dorina Antonovici	Walk In Ref #9	05/22/13 18:02	Return to Storage
JB37147-2.1	Walk In Ref #9	Amirhossein Farvardin	05/23/13 17:06	Retrieve from Storage
JB37147-2.1	Amirhossein Farvardin	Walk In Ref #9	05/23/13 22:29	Return to Storage
JB37147-2.2	Walk In Ref #9	Chris Cataldo	05/25/13 15:53	Retrieve from Storage
JB37147-2.2	Chris Cataldo	Walk In Ref #9	05/25/13 15:54	Return to Storage
JB37147-3.1	Walk In Ref #9	Mehdi Abdolrahim	05/20/13 10:31	Retrieve from Storage
JB37147-3.1	Mehdi Abdolrahim	Walk In Ref #9	05/20/13 12:42	Return to Storage
JB37147-3.1	Walk In Ref #9	Dorina Antonovici	05/22/13 14:07	Retrieve from Storage
JB37147-3.1	Dorina Antonovici	Walk In Ref #9	05/22/13 18:02	Return to Storage
JB37147-3.1	Walk In Ref #9	Amirhossein Farvardin	05/23/13 17:06	Retrieve from Storage
JB37147-3.1	Amirhossein Farvardin	Walk In Ref #9	05/23/13 22:29	Return to Storage
JB37147-3.2	Walk In Ref #9	Chris Cataldo	05/25/13 15:53	Retrieve from Storage
JB37147-3.2	Chris Cataldo	Walk In Ref #9	05/25/13 15:54	Return to Storage
JB37147-4.1	Walk In Ref #9	Mehdi Abdolrahim	05/20/13 10:31	Retrieve from Storage
JB37147-4.1	Mehdi Abdolrahim	Walk In Ref #9	05/20/13 12:42	Return to Storage
JB37147-4.1	Walk In Ref #9	Dorina Antonovici	05/22/13 14:07	Retrieve from Storage
JB37147-4.1	Dorina Antonovici	Walk In Ref #9	05/22/13 18:02	Return to Storage
JB37147-4.1	Walk In Ref #9	Amirhossein Farvardin	05/23/13 17:06	Retrieve from Storage
JB37147-4.1	Amirhossein Farvardin	Walk In Ref #9	05/23/13 22:29	Return to Storage
JB37147-4.2	Walk In Ref #9	Chris Cataldo	05/25/13 15:53	Retrieve from Storage
JB37147-4.2	Chris Cataldo	Walk In Ref #9	05/25/13 15:54	Return to Storage



GC/MS Semi-volatiles

QC Data Summaries

(Accutest Labs of New England, Inc.)

6

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Instrument Performance Checks (DFTPP)
- Internal Standard Area Summaries
- Surrogate Recovery Summaries
- Initial and Continuing Calibration Summaries

Method Blank Summary

Job Number: JB37147

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP33326-MB	F64579.D	1	05/29/13	KR	05/25/13	OP33326	MSF3012

The QC reported here applies to the following samples:

Method: SW846 8270C

JB37147-1, JB37147-2, JB37147-3, JB37147-4

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	99	34	ug/kg	
56-55-3	Benzo(a)anthracene	ND	99	38	ug/kg	
50-32-8	Benzo(a)pyrene	ND	99	23	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	99	24	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	99	45	ug/kg	
218-01-9	Chrysene	ND	99	40	ug/kg	
86-73-7	Fluorene	ND	99	35	ug/kg	
91-20-3	Naphthalene	ND	99	38	ug/kg	
85-01-8	Phenanthrene	ND	99	30	ug/kg	
129-00-0	Pyrene	ND	99	30	ug/kg	

CAS No.	Surrogate Recoveries	Limits
367-12-4	2-Fluorophenol	84% 30-130%
4165-62-2	Phenol-d5	82% 30-130%
118-79-6	2,4,6-Tribromophenol	82% 30-130%
4165-60-0	Nitrobenzene-d5	90% 30-130%
321-60-8	2-Fluorobiphenyl	81% 30-130%
1718-51-0	Terphenyl-d14	91% 30-130%

Blank Spike Summary

Page 1 of 1

Job Number: JB37147

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP33326-BS	F64580.D	1	05/29/13	KR	05/25/13	OP33326	MSF3012

The QC reported here applies to the following samples:

Method: SW846 8270C

JB37147-1, JB37147-2, JB37147-3, JB37147-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
120-12-7	Anthracene	2460	2040	83	40-140
56-55-3	Benzo(a)anthracene	2460	2290	93	40-140
50-32-8	Benzo(a)pyrene	2460	1980	81	40-140
205-99-2	Benzo(b)fluoranthene	2460	2390	97	40-140
191-24-2	Benzo(g,h,i)perylene	2460	2140	87	40-140
218-01-9	Chrysene	2460	2120	86	40-140
86-73-7	Fluorene	2460	2170	88	40-140
91-20-3	Naphthalene	2460	2050	83	40-140
85-01-8	Phenanthrene	2460	2130	87	40-140
129-00-0	Pyrene	2460	2210	90	40-140

CAS No.	Surrogate Recoveries	BSP	Limits
367-12-4	2-Fluorophenol	82%	30-130%
4165-62-2	Phenol-d5	83%	30-130%
118-79-6	2,4,6-Tribromophenol	87%	30-130%
4165-60-0	Nitrobenzene-d5	91%	30-130%
321-60-8	2-Fluorobiphenyl	82%	30-130%
1718-51-0	Terphenyl-d14	89%	30-130%

* = Outside of Control Limits.

9.2.1

9

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JB37147

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP33326-MS	F64581.D	5	05/29/13	KR	05/25/13	OP33326	MSF3012
OP33326-MSD	F64582.D	5	05/29/13	KR	05/25/13	OP33326	MSF3012
MC20894-1 ^a	F64583.D	5	05/29/13	KR	05/25/13	OP33326	MSF3012

The QC reported here applies to the following samples:

Method: SW846 8270C

JB37147-1, JB37147-2, JB37147-3, JB37147-4

CAS No.	Compound	MC20894-1		Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
		ug/kg	Q							
120-12-7	Anthracene	ND	6360	3340	52	3470	52	4	40-140/30	
56-55-3	Benzo(a)anthracene	ND	6360	3850	61	3950	59	3	40-140/30	
50-32-8	Benzo(a)pyrene	ND	6360	2860	45	2880	43	1	40-140/30	
205-99-2	Benzo(b)fluoranthene	ND	6360	4410	69	4470	67	1	40-140/30	
191-24-2	Benzo(g,h,i)perylene	ND	6360	2950	46	3110	47	5	40-140/30	
218-01-9	Chrysene	ND	6360	3550	56	3650	55	3	40-140/30	
86-73-7	Fluorene	ND	6360	3700	58	3900	58	5	40-140/30	
91-20-3	Naphthalene	ND	6360	3710	58	3980	60	7	40-140/30	
85-01-8	Phenanthrene	ND	6360	4490	71	3970	59	12	40-140/30	
129-00-0	Pyrene	ND	6360	4100	64	3800	57	8	40-140/30	

CAS No.	Surrogate Recoveries	MS	MSD	MC20894-1	Limits
367-12-4	2-Fluorophenol	51%	55%	43%	30-130%
4165-62-2	Phenol-d5	51%	53%	40%	30-130%
118-79-6	2,4,6-Tribromophenol	46%	48%	37%	30-130%
4165-60-0	Nitrobenzene-d5	57%	62%	49%	30-130%
321-60-8	2-Fluorobiphenyl	53%	57%	50%	30-130%
1718-51-0	Terphenyl-d14	51%	55%	48%	30-130%

(a) Elevated RL due to dilution required for matrix interference.

* = Outside of Control Limits.

9.3.1
9

Instrument Performance Check (DFTPP)

Page 1 of 1

Job Number: JB37147

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample:	MSF2937-DFTPP	Injection Date:	04/08/13
Lab File ID:	F62770.D	Injection Time:	08:39
Instrument ID:	GCMSF		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
51	30.0 - 60.0% of mass 198	5601	47.4	Pass
68	Less than 2.0% of mass 69	0	0.00	(0.00) ^a Pass
69	Mass 69 relative abundance	6603	55.9	Pass
70	Less than 2.0% of mass 69	0	0.00	(0.00) ^a Pass
127	40.0 - 60.0% of mass 198	5966	50.5	Pass
197	Less than 1.0% of mass 198	0	0.00	Pass
198	Base peak, 100% relative abundance	11811	100.0	Pass
199	5.0 - 9.0% of mass 198	800	6.77	Pass
275	10.0 - 30.0% of mass 198	2978	25.2	Pass
365	1.0 - 100.0% of mass 198	234	1.98	Pass
441	Present, but less than mass 443	860	7.28	(76.3) ^b Pass
442	39.0 - 100.0% of mass 198	6440	54.5	Pass
443	17.0 - 23.0% of mass 442	1127	9.54	(17.5) ^c Pass

(a) Value is % of mass 69

(b) Value is % of mass 443

(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
MSF2937-ICC2937	F62772.D	04/08/13	09:28	00:49	Initial cal 80
MSF2937-IC2937	F62773.D	04/08/13	09:52	01:13	Initial cal 1
MSF2937-IC2937	F62774.D	04/08/13	10:16	01:37	Initial cal 2
MSF2937-IC2937	F62775.D	04/08/13	10:40	02:01	Initial cal 5
MSF2937-IC2937	F62776.D	04/08/13	11:04	02:25	Initial cal 10
MSF2937-IC2937	F62777.D	04/08/13	11:28	02:49	Initial cal 20
MSF2937-IC2937	F62778.D	04/08/13	11:53	03:14	Initial cal 50
MSF2937-IC2937	F62779.D	04/08/13	12:17	03:38	Initial cal 120
MSF2937-ICV2937	F62780.D	04/08/13	12:42	04:03	Initial cal verification 20
MSF2937-ICV2937	F62781.D	04/08/13	13:07	04:28	Initial cal verification 50
MSF2937-ICV2937	F62782.D	04/08/13	13:32	04:53	Initial cal verification 20
MSF2937-ICV2937	F62783.D	04/08/13	13:57	05:18	Initial cal verification 20

9.4.1
6

Instrument Performance Check (DFTPP)

Page 1 of 2

Job Number: JB37147

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample:	MSF3012-DFTPP	Injection Date:	05/29/13
Lab File ID:	F64577.D	Injection Time:	15:46
Instrument ID:	GCMSF		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
51	30.0 - 60.0% of mass 198	11078	37.0	Pass
68	Less than 2.0% of mass 69	0	0.00	(0.00) ^a Pass
69	Mass 69 relative abundance	13759	46.0	Pass
70	Less than 2.0% of mass 69	0	0.00	(0.00) ^a Pass
127	40.0 - 60.0% of mass 198	13630	45.5	Pass
197	Less than 1.0% of mass 198	0	0.00	Pass
198	Base peak, 100% relative abundance	29939	100.0	Pass
199	5.0 - 9.0% of mass 198	2089	6.98	Pass
275	10.0 - 30.0% of mass 198	8713	29.1	Pass
365	1.0 - 100.0% of mass 198	993	3.32	Pass
441	Present, but less than mass 443	4484	15.0	(85.2) ^b Pass
442	40.0 - 100.0% of mass 198	26731	89.3	Pass
443	17.0 - 23.0% of mass 442	5262	17.6	(19.7) ^c Pass

(a) Value is % of mass 69

(b) Value is % of mass 443

(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
MSF3012-CC2937	F64578.D	05/29/13	16:07	00:21	Continuing cal 50
OP33326-MB	F64579.D	05/29/13	16:31	00:45	Method Blank
OP33326-BS	F64580.D	05/29/13	16:54	01:08	Blank Spike
OP33326-MS	F64581.D	05/29/13	17:17	01:31	Matrix Spike
OP33326-MSD	F64582.D	05/29/13	17:40	01:54	Matrix Spike Duplicate
MC20894-1	F64583.D	05/29/13	18:03	02:17	(used for QC only; not part of job JB37147)
JB37147-1	F64584.D	05/29/13	18:26	02:40	AOI-5_MW-441_8-10'_51513
JB37147-2	F64585.D	05/29/13	18:49	03:03	AOI-5_MW-441_0-2'_51513
JB37147-3	F64586.D	05/29/13	19:12	03:26	AOI-5_MW-449_2-2'_51513
JB37147-4	F64587.D	05/29/13	19:34	03:48	AOI-5_MW-445_3-3.5'_51513
ZZZZZZ	F64588.D	05/29/13	19:57	04:11	(unrelated sample)
ZZZZZZ	F64589.D	05/29/13	20:20	04:34	(unrelated sample)
ZZZZZZ	F64590.D	05/29/13	20:44	04:58	(unrelated sample)
ZZZZZZ	F64591.D	05/29/13	21:08	05:22	(unrelated sample)
ZZZZZZ	F64592.D	05/29/13	21:31	05:45	(unrelated sample)
ZZZZZZ	F64593.D	05/29/13	21:55	06:09	(unrelated sample)
ZZZZZZ	F64594.D	05/29/13	22:18	06:32	(unrelated sample)
ZZZZZZ	F64595.D	05/29/13	22:41	06:55	(unrelated sample)
ZZZZZZ	F64596.D	05/29/13	23:05	07:19	(unrelated sample)

Instrument Performance Check (DFTPP)

Page 2 of 2

Job Number: JB37147

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample:	MSF3012-DFTPP	Injection Date:	05/29/13
Lab File ID:	F64577.D	Injection Time:	15:46
Instrument ID:	GCMSF		

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
ZZZZZZ	F64597.D	05/29/13	23:29	07:43	(unrelated sample)
ZZZZZZ	F64598.D	05/29/13	23:52	08:06	(unrelated sample)
ZZZZZZ	F64599.D	05/30/13	00:16	08:30	(unrelated sample)
ZZZZZZ	F64600.D	05/30/13	00:39	08:53	(unrelated sample)
ZZZZZZ	F64601.D	05/30/13	01:03	09:17	(unrelated sample)
ZZZZZZ	F64602.D	05/30/13	01:26	09:40	(unrelated sample)
ZZZZZZ	F64603.D	05/30/13	01:50	10:04	(unrelated sample)
ZZZZZZ	F64604.D	05/30/13	02:14	10:28	(unrelated sample)
ZZZZZZ	F64605.D	05/30/13	02:37	10:51	(unrelated sample)

Semivolatile Internal Standard Area Summary

Page 1 of 2

Job Number: JB37147

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	MSF3012-CC2937	Injection Date:	05/29/13
Lab File ID:	F64578.D	Injection Time:	16:07
Instrument ID:	GCMSF	Method:	SW846 8270C

	IS 1 AREA	IS 1 RT	IS 2 AREA	IS 2 RT	IS 3 AREA	IS 3 RT	IS 4 AREA	IS 4 RT	IS 5 AREA	IS 5 RT	IS 6 AREA	IS 6 RT
Check Std	48229	3.75	182832	4.87	120697	6.50	220480	7.90	245677	10.70	215920	12.18
Upper Limit ^a	96458	4.25	365664	5.37	241394	7.00	440960	8.40	491354	11.20	431840	12.68
Lower Limit ^b	24115	3.25	91416	4.37	60349	6.00	110240	7.40	122839	10.20	107960	11.68

Lab Sample ID	IS 1 AREA	IS 1 RT	IS 2 AREA	IS 2 RT	IS 3 AREA	IS 3 RT	IS 4 AREA	IS 4 RT	IS 5 AREA	IS 5 RT	IS 6 AREA	IS 6 RT
OP33326-MB	40733	3.75	153984	4.87	100225	6.49	183296	7.90	194816	10.69	179912	12.18
OP33326-BS	43098	3.76	160098	4.87	103984	6.50	189533	7.90	199012	10.70	176449	12.18
OP33326-MS	39136	3.76	148079	4.87	96474	6.49	180491	7.90	202757	10.69	161321	12.18
OP33326-MSD	38675	3.76	145577	4.87	96303	6.49	175661	7.90	196653	10.69	155118	12.18
MC20894-1	39362	3.75	149346	4.87	95432	6.49	177119	7.90	195495	10.69	156204	12.18
JB37147-1	43857	3.75	166146	4.87	106398	6.49	191495	7.90	203519	10.69	188788	12.18
JB37147-2	40576	3.76	150322	4.87	96970	6.49	172035	7.90	184162	10.69	164506	12.18
JB37147-3	45400	3.76	168176	4.87	105408	6.49	186932	7.90	193473	10.69	168445	12.18
JB37147-4	45680	3.75	172327	4.87	110803	6.49	189401	7.90	217322	10.70	209949	12.19
ZZZZZZ	39911	3.76	149349	4.87	95325	6.49	175203	7.90	180279	10.69	166485	12.18
ZZZZZZ	41031	3.76	153816	4.87	99277	6.49	179811	7.90	193693	10.69	174005	12.18
ZZZZZZ	41509	3.75	155935	4.87	102739	6.49	191117	7.90	196974	10.69	176832	12.18
ZZZZZZ	44474	3.76	169072	4.87	109287	6.49	199093	7.90	217558	10.70	203037	12.19
ZZZZZZ	40226	3.76	149210	4.87	94673	6.49	176050	7.90	186910	10.69	175011	12.19
ZZZZZZ	43461	3.76	161167	4.87	104593	6.49	187328	7.90	194609	10.69	179807	12.18
ZZZZZZ	39552	3.75	148643	4.87	95185	6.49	174108	7.90	181007	10.69	171508	12.18
ZZZZZZ	44098	3.76	161300	4.87	103962	6.49	192930	7.90	198969	10.69	188850	12.18
ZZZZZZ	40834	3.75	154090	4.87	98979	6.49	181717	7.90	195310	10.69	184264	12.18
ZZZZZZ	46933	3.75	174973	4.87	109310	6.49	188493	7.90	210156	10.69	194950	12.18
ZZZZZZ	45843	3.76	172671	4.87	111513	6.49	206329	7.90	226201	10.69	210410	12.19
ZZZZZZ	41302	3.76	153842	4.87	99620	6.49	180748	7.90	196881	10.69	182677	12.18
ZZZZZZ	48559	3.76	178832	4.87	113921	6.49	200503	7.90	201949	10.69	184493	12.18
ZZZZZZ	47014	3.76	176294	4.87	111930	6.49	200105	7.90	214891	10.69	198942	12.18
ZZZZZZ	41655	3.76	154097	4.87	100169	6.49	186394	7.90	216600	10.69	173310	12.18
ZZZZZZ	44523	3.76	165956	4.87	107305	6.49	189726	7.90	201027	10.69	180031	12.18
ZZZZZZ	45261	3.76	166616	4.87	104772	6.49	181965	7.90	192799	10.69	167099	12.18
ZZZZZZ	41612	3.76	158638	4.87	102265	6.49	187156	7.90	209990	10.69	182270	12.19

IS 1 = 1,4-Dichlorobenzene-d4

IS 2 = Naphthalene-d8

IS 3 = Acenaphthene-D10

IS 4 = Phenanthrene-d10

IS 5 = Chrysene-d12

IS 6 = Perylene-d12

Semivolatile Internal Standard Area Summary

Page 2 of 2

Job Number: JB37147

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	MSF3012-CC2937	Injection Date:	05/29/13
Lab File ID:	F64578.D	Injection Time:	16:07
Instrument ID:	GCMSF	Method:	SW846 8270C

Lab	IS 1	IS 2	IS 3	IS 4	IS 5	IS 6
Sample ID	AREA	RT	AREA	RT	AREA	RT

(a) Upper Limit = + 100% of check standard area; Retention time + 0.5 minutes.

(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

9.5.1
9

Semivolatile Surrogate Recovery Summary

Page 1 of 1

Job Number: JB37147

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Method: SW846 8270C

Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3
JB37147-1	F64584.D	75.0	70.0	76.0
JB37147-2	F64585.D	77.0	70.0	78.0
JB37147-3	F64586.D	77.0	74.0	79.0
JB37147-4	F64587.D	70.0	71.0	80.0
OP33326-BS	F64580.D	91.0	82.0	89.0
OP33326-MB	F64579.D	90.0	81.0	91.0
OP33326-MS	F64581.D	57.0	53.0	51.0
OP33326-MSD	F64582.D	62.0	57.0	55.0

Surrogate Compounds	Recovery Limits
------------------------	--------------------

S1 = Nitrobenzene-d5	30-130%
S2 = 2-Fluorobiphenyl	30-130%
S3 = Terphenyl-d14	30-130%

9.6.1
9

Initial Calibration Summary

Job Number: JB37147

Sample: MSF2937-ICC2937

Account: ALNJ Accutest New Jersey

Lab FileID: F62772.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Response Factor Report MSF

Method : C:\msdchem\1\MET...\\F130408_8270+.m (RTE Integrator)
 Title : SW-864 Method 8270
 Last Update : Wed Apr 10 10:06:30 2013
 Response via : Initial Calibration

Calibration Files

120 =f62779.D	80 =f62772.D	20 =f62777.D	5 =f62775.D
2 =f62774.D	10 =f62776.D	50 =f62778.D	1 =f62773.D
=	=		

Compound	120	80	20	5	2	10	50	1	Avg	%RSD
----------	-----	----	----	---	---	----	----	---	-----	------

1) I 1,4-Dichlorobenzene-d	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
2) N-nitrosodimethylamine										
	0.787	0.802	0.791	0.688		0.724	0.793		0.764	6.11
3) Pyridine										
	1.491	1.488	1.460	1.275	1.637	1.431	1.484		1.467	7.28
4) Methyl Methanesulfonate										
	0.692	0.685	0.655	0.636	0.566	0.648	0.694		0.654	6.87
5) Ethyl Methanesulfonate										
	0.945	0.943	0.933	0.872	0.984	0.888	0.925		0.927	4.03
6) Aniline										
	0.833	0.823	0.867	0.800	0.785	0.856	0.870		0.833	3.96
7) 2-Fluorophenol										
	1.213	1.242	1.177	1.111	0.982	1.128	1.244		1.157	8.05
8) bis(2-Chloroethyl)ether										
	0.850	0.862	0.854	0.805	0.928	0.838	0.873		0.858	4.36
9) Phenol-d5										
	1.528	1.561	1.501	1.390	1.323	1.487	1.529		1.474	5.82
10) Phenol										
	1.724	1.730	1.692	1.559	1.485	1.582	1.704	1.529	1.626	6.00
11) 2-Chlorophenol										
	1.308	1.329	1.296	1.218	1.170	1.257	1.316		1.271	4.62
12) 1,3-Dichlorobenzene										
	1.453	1.460	1.464	1.496	1.460	1.478	1.470	1.437	1.465	1.18
13) 1,4-Dichlorobenzene										
	1.585	1.594	1.592	1.584	1.594	1.573	1.547	1.519	1.574	1.72
14) 1,2-Dichlorobenzene										
	1.408	1.432	1.416	1.433	1.306	1.383	1.455	1.281	1.389	4.54
15) Benzyl alcohol										
	0.628	0.615	0.539	0.445		0.446	0.552		0.538	14.73
16) bis(2-chloroisopropyl)ether										
	1.108	1.142	1.147	1.090	1.148	1.124	1.133		1.127	1.93
17) o-cresol										
	1.242	1.287	1.313	1.186	1.111	1.186	1.284		1.230	5.87
18) Acetophenone										
	1.841	1.886	1.853	1.793	1.707	1.812	1.859		1.822	3.26
19) Hexachloroethane										
	0.547	0.553	0.533	0.548	0.577	0.537	0.550		0.549	2.61
20) N-Nitroso-di-n-propylamine										
	0.925	0.952	0.944	0.914	0.822	0.905	0.954		0.917	5.00
21) m+p-cresols										
	1.254	1.291	1.244	1.232	1.158	1.302	1.261		1.249	3.78
22) 4-methylphenol										
	1.254	1.291	1.244	1.232	1.158	1.302	1.261		1.249	3.78
23) Benzaldehyde										

9.7.1

6

Initial Calibration Summary

Page 2 of 4

Job Number: JB37147

Sample: MSF2937-ICC2937

Account: ALNJ Accutest New Jersey

Lab FileID: F62772.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

	3.966	4.093	4.000	3.950	3.962	4.013	3.832	3.974	1.98						
24)	I	Naphthalene-d8			-----	ISTD-----									
25)		Nitrobenzene-d5			0.390	0.393	0.379	0.335	0.290	0.372	0.384	0.313	0.357	10.95	
26)		Nitrobenzene			0.383	0.395	0.381	0.370	0.368	0.381	0.385		0.380	2.36	
27)	I	Isophorone			0.608	0.612	0.600	0.557	0.528	0.566	0.602		0.582	5.48	
28)		2-Nitrophenol			0.207	0.206	0.189	0.167		0.176	0.196		0.190	8.47	
29)		2,4-Dimethylphenol			0.379	0.388	0.377	0.366		0.360	0.378		0.375	2.68	
30)		bis(2-Chloroethoxy)methane			0.391	0.394	0.382	0.354		0.357	0.394		0.379	4.84	
31)		Benzoic acid			0.207	0.202	0.106	0.045		0.067	0.172		0.133	52.58	
		----- Quadratic regression -----										Coefficient =	0.9977		
		Response Ratio = -0.03083 + 0.19101 *A + 0.00947 *A^2													
32)		2,4-Dichlorophenol			0.316	0.318	0.292	0.263		0.292	0.315		0.299	7.14	
33)		1,2,4-Trichlorobenzene			0.362	0.365	0.363	0.346	0.328	0.347	0.351		0.352	3.77	
34)		Naphthalene			1.014	1.021	0.999	0.988	0.976	0.983	1.004	0.999		0.998	1.53
35)		2,6-Dichlorophenol			0.318	0.318	0.313	0.298		0.295	0.313		0.309	3.32	
36)		4-Chloroaniline			0.450	0.446	0.442	0.391		0.409	0.453		0.432	5.93	
37)		Hexachlorobutadiene			0.236	0.234	0.229	0.219	0.220	0.226	0.236		0.228	3.20	
38)		4-Chloro-3-methylphenol			0.333	0.324	0.315	0.292		0.304	0.323		0.315	4.74	
39)		2-Methylnaphthalene			0.720	0.717	0.706	0.680	0.671	0.697	0.695	0.640		0.691	3.85
40)		1-Methylnaphthalene			0.675	0.671	0.690	0.653	0.663	0.655	0.674	0.644		0.666	2.24
41)		1,2,4,5-Tetrachlorobenzene			0.428	0.429	0.427	0.410	0.386	0.409	0.417			0.415	3.69
42)		Caprolactam			0.124	0.126	0.116	0.101		0.105	0.119			0.115	8.55
43)	I	Acenaphthene-d10			-----	ISTD-----									
44)		Pentachloronitrobenzene			0.182	0.180	0.175	0.151		0.167	0.181			0.173	6.93
45)		Hexachlorocyclopentadiene			0.335	0.315	0.253	0.180		0.214	0.299			0.266	22.92
		----- Linear regression -----								Coefficient =	0.9984				
		Response Ratio = -0.07412 + 0.34179 *A													
46)		2,4,6-Trichlorophenol			0.408	0.395	0.378	0.338		0.367	0.399			0.381	6.77
47)		2,4,5-Trichlorophenol			0.447	0.437	0.435	0.352		0.398	0.442			0.418	8.81
48)		2-Fluorobiphenyl			1.385	1.332	1.365	1.349	1.205	1.355	1.350	1.294		1.329	4.27
49)		2-Chloronaphthalene			1.082	1.072	1.061	1.026	1.014	1.063	1.082	0.945		1.043	4.49
50)		Acenaphthylene													

97.1
6

Initial Calibration Summary

Job Number: JB37147

Sample:

MSF2937-ICC2937

Account: ALNJ Accutest New Jersey

Lab FileID:

F62772.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

51)	Dimethylphthalate	1.796 1.769 1.754 1.717 1.615 1.743 1.788 1.656	1.730	3.71
		1.316 1.297 1.312 1.273 1.268 1.284 1.289 1.263	1.288	1.54
52)	2,4-Dinitrotoluene	0.308 0.301 0.285 0.245	0.278 0.301	0.287 8.08
53)	Acenaphthene	1.132 1.098 1.117 1.087 1.035 1.114 1.118 1.114	1.102	2.74
54)	2,4-Dinitrophenol	0.178 0.147 0.074 0.173	0.035 0.129	0.122 46.73
	----- Quadratic regression -----		Coefficient = 0.9976	
	Response Ratio = -0.00475 + 0.08858 *A + 0.03048 *A^2			
55)	Dibenzofuran	1.648 1.650 1.693 1.580 1.518 1.653 1.650 1.559	1.619	3.68
56)	2,6-Dinitrotoluene	0.413 0.401 0.376 0.336	0.358 0.403	0.381 7.86
57)	4-Nitrophenol	0.218 0.213 0.178	0.158 0.224	0.198 14.55
58)	2,3,4,6-Tetrachlorophenol	0.386 0.374 0.341 0.291	0.313 0.360	0.344 10.71
59)	Fluorene	1.299 1.301 1.279 1.262 1.196 1.303 1.293 1.166	1.262	4.17
60)	4-Chlorophenyl-phenylether	0.724 0.715 0.708 0.664 0.695 0.703 0.714	0.703	2.78
61)	Diethylphthalate	1.220 1.191 1.171 1.131 1.089 1.157 1.192 1.157	1.164	3.48
62)	2-nitroaniline	0.382 0.365 0.337	0.323 0.361	0.354 6.57
63)	3-nitroaniline	0.318 0.311 0.286 0.263	0.275 0.314	0.295 7.82
64)	4-nitroaniline	0.321 0.319 0.291 0.257	0.265 0.317	0.295 9.71
65)	1,1'-Biphenyl	1.370 1.339 1.335 1.305 1.206 1.331 1.361 1.187	1.304	5.33
66)	I Phenanthrene-d10	----- ISTD -----		
67)	4,6-Dinitro-2-methylphenol	0.150 0.137 0.098 0.044	0.063 0.130	0.104 41.52
	----- Linear regression -----	Coefficient = 0.9974		
	Response Ratio = -0.02441 + 0.15503 *A			
68)	n-Nitrosodiphenylamine	0.525 0.520 0.483 0.480 0.467 0.497 0.511	0.498	4.41
69)	1,2-Diphenylhydrazine	0.652 0.636 0.596 0.590 0.558 0.609 0.644	0.612	5.50
70)	2,4,6-Tribromophenol	0.125 0.122 0.110 0.086	0.107 0.117	0.111 12.73
71)	4-Bromophenyl-phenylether	0.249 0.246 0.233 0.222 0.205 0.233 0.247	0.233	6.78
72)	Hexachlorobenzene	0.271 0.266 0.254 0.249 0.252 0.259 0.265	0.259	3.15
73)	Pentachlorophenol	0.123 0.114 0.082 0.046	0.067 0.106	0.090 33.27#
	----- Linear regression -----	Coefficient = 0.9975		
	Response Ratio = -0.01798 + 0.12678 *A			
74)	Phenanthrene	1.053 1.054 1.014 1.004 0.981 1.025 1.046 1.056	1.029	2.70
75)	Anthracene	1.112 1.108 1.062 1.051 0.993 1.062 1.097 0.997	1.060	4.35

9.7.1

6

Initial Calibration Summary

Job Number: JB37147
 Account: ALNJ Accutest New Jersey
 Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: MSF2937-ICC2937
 Lab FileID: F62772.D

76)	Carbazole	0.965 0.970 0.934 0.903 0.891 0.933 0.969 0.859	0.928	4.39
77)	Di-n-butylphthalate	1.133 1.119 1.053 0.987 0.924 1.000 1.128	1.049	7.78
78)	Fluoranthene	1.256 1.261 1.211 1.177 1.096 1.200 1.257 1.069	1.191	6.19
79)	Atrazine	0.211 0.208 0.199 0.187 0.180 0.196 0.212	0.199	6.19
80)	I Chrysene-d12	-----ISTD-----		
81)	Benzidine	0.345 0.523 0.442 0.384 0.451 0.425	0.428	14.26
82)	Pyrene	1.164 1.165 1.157 1.127 1.079 1.137 1.180 1.134	1.143	2.75
83)	Terphenyl-d14	0.903 0.919 0.886 0.830 0.846 0.872 0.914 0.814	0.873	4.53
84)	3,3-Dimethylbenzidine	0.520 0.452 0.496 0.519 0.389	0.475	11.70
85)	Butylbenzylphthalate	0.409 0.405 0.388 0.329 0.364 0.397	0.382	8.04
86)	3,3'-Dichlorobenzidine	0.391 0.419 0.380 0.351 0.371 0.404	0.386	6.25
87)	Benzo[a]anthracene	1.039 1.034 1.020 0.971 0.977 1.003 1.044 1.006	1.012	2.72
88)	Chrysene	1.023 1.031 1.030 0.982 1.004 1.019 1.033 0.972	1.012	2.31
89)	bis(2-Ethylhexyl)phthalate	0.574 0.569 0.528 0.468 0.487 0.559	0.531	8.40
90)	I Perylene-d12	-----ISTD-----		
91)	Di-n-octylphthalate	1.023 1.015 0.897 0.781 0.837 0.980	0.922	10.85
92)	Benzo[b]fluoranthene	1.280 1.280 1.271 1.074 1.106 1.212 1.255 1.110	1.199	7.32
93)	Benzo[k]fluoranthene	1.108 1.092 1.035 1.156 1.049 1.068 1.098 1.096	1.088	3.45
94)	Benzo[a]pyrene	1.139 1.136 1.117 1.036 1.025 1.068 1.134 0.999	1.082	5.26
95)	Indeno[1,2,3-cd]pyrene	1.366 1.333 1.307 1.218 1.277 1.275 1.300 1.218	1.287	4.02
96)	Dibenz[a,h]anthracene	1.139 1.112 1.058 1.030 1.050 1.059 1.074 1.076	1.075	3.27
97)	Benzo[g,h,i]perylene	1.095 1.073 1.051 1.014 1.069 1.057 1.036 1.029	1.053	2.50

(#) = Out of Range ### Number of calibration levels exceeded format ###

F130408_8270+.m

Wed Apr 10 10:07:34 2013 R1

Initial Calibration Verification

Job Number: JB37147

Sample: MSF2937-ICV2937

Account: ALNJ Accutest New Jersey

Lab FileID: F62780.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\F130408\f62780.D Vial: 8
 Acq On : 8 Apr 2013 12:42 pm Operator: KRISTINR
 Sample : ICV2937-20 Inst : MSF
 Misc : op32443,msf2937,1000,,,1,1 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : C:\msdchem\1\MET...\F130408_8270+.m (RTE Integrator)
 Title : SW-864 Method 8270
 Last Update : Mon Apr 08 13:02:18 2013
 Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)R.T.
1 I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	102	0.00
2	N-nitrosodimethylamine	0.764	0.834	-9.2	108	0.00
3 T	Pyridine	1.467	1.596	-8.8	112	0.00
4 T	Methyl Methanesulfonate			-----NA-----		
5 T	Ethyl Methanesulfonate			-----NA-----		
6 T	Aniline			-----NA-----		
7 S	2-Fluorophenol			-----NA-----		
8 T	bis(2-Chloroethyl)ether	0.858	0.905	-5.5	108	0.00
9 S	Phenol-d5			-----NA-----		
10 C	Phenol			-----NA-----		
11 M	2-Chlorophenol			-----NA-----		
12 T	1,3-Dichlorobenzene	1.465	1.587	-8.3	111	0.00
13 C	1,4-Dichlorobenzene	1.574	1.693	-7.6	109	0.00
14 T	1,2-Dichlorobenzene	1.389	1.540	-10.9	111	0.00
15 T	Benzyl alcohol	0.538	0.610	-13.4	116	0.00
16 T	bis(2-chloroisopropyl)eth	1.127	1.421	-26.1#	126	0.00
17 T	o-cresol			-----NA-----		
18 T	Acetophenone	1.822	1.992	-9.3	106	0.00
19 T	Hexachloroethane	0.549	0.584	-6.4	112	0.00
20 P	N-Nitroso-di-n-propylamin	0.917	1.002	-9.3	108	0.00
21 T	m+p-cresols			-----NA-----		
22	4-methylphenol			-----NA-----		
23	Benzaldehyde			-----NA-----		
24 I	Naphthalene-d8	1.000	1.000	0.0	103	0.00
25 S	Nitrobenzene-d5	0.357	0.386	-8.1	105	0.00
26 T	Nitrobenzene	0.380	0.408	-7.4	110	0.00
27 T	Isophorone	0.582	0.656	-12.7	112	0.00
28 C	2-Nitrophenol			-----NA-----		
29 T	2,4-Dimethylphenol			-----NA-----		
30 T	bis(2-Chloroethoxy)methan	0.379	0.402	-6.1	108	0.00
31 T	Benzoic acid		True	Calc.	% Drift	-----
32 C	2,4-Dichlorophenol			-----NA-----		
33 M	1,2,4-Trichlorobenzene	0.352	0.387	-9.9	109	0.00
34 T	Naphthalene	0.998	1.088	-9.0	112	0.00
35 T	2,6-Dichlorophenol			-----NA-----		
36 T	4-Chloroaniline			-----NA-----		
37 C	Hexachlorobutadiene	0.228	0.260	-14.0	116	0.00

Initial Calibration Verification

Job Number: JB37147

Sample: MSF2937-ICV2937

Account: ALNJ Accutest New Jersey

Lab FileID: F62780.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

38 C	4-Chloro-3-methylphenol		-----NA-----					
39 T	2-Methylnaphthalene	0.691	0.735	-6.4	107	0.00	5.72	
40 T	1-Methylnaphthalene	0.666	0.729	-9.5	109	0.00	5.81	
41 T	1,2,4,5-Tetrachlorobenzene	0.415	0.442	-6.5	107	0.00	5.89	
42	Caprolactam		-----NA-----					
43 I	Acenaphthene-d10	1.000	1.000	0.0	101	0.00	6.60	
44 T	Pentachloronitrobenzene	0.173	0.168	2.9	97	0.00	7.91	
45 P	Hexachlorocyclopentadiene	40.000	39.322	1.7	76	0.00	5.90	
		-----AvgRF-----	CCRF	% Dev				
46 C	2,4,6-Trichlorophenol		-----NA-----					
47 T	2,4,5-Trichlorophenol		-----NA-----					
48 S	2-Fluorobiphenyl	1.329	1.393	-4.8	103	0.00	6.03	
49 T	2-Chloronaphthalene	1.043	1.158	-11.0	110	0.00	6.11	
50 M	Acenaphthylene	1.730	1.562	9.7	90	0.00	6.47	
51 T	Dimethylphthalate	1.288	1.355	-5.2	105	0.00	6.38	
52 T	2,4-Dinitrotoluene	0.287	0.292	-1.7	104	0.00	6.44	
53 C	Acenaphthene	1.102	1.226	-11.3	112	0.00	6.62	
54 P	2,4-Dinitrophenol		-----True-----	Calc.	% Drift			
			-----NA-----					
55 T	Dibenzofuran	1.619	1.676	-3.5	100	0.00	6.76	
56 M	2,6-Dinitrotoluene	0.381	0.384	-0.8	104	0.00	6.78	
57 P	4-Nitrophenol		-----NA-----					
58 T	2,3,4,6-Tetrachlorophenol		-----NA-----					
59 T	Fluorene	1.262	1.408	-11.6	112	0.00	7.07	
60 T	4-Chlorophenyl-phenylethane	0.703	0.769	-9.4	110	0.00	7.05	
61 T	Diethylphthalate	1.164	1.255	-7.8	109	0.00	6.99	
62 T	2-nitroaniline	0.354	0.365	-3.1	110	0.00	6.22	
63 T	3-nitroaniline	0.295	0.264	10.5	94	0.00	6.57	
64 T	4-nitroaniline	0.295	0.294	0.3	103	0.00	7.11	
65	1,1'-Biphenyl	1.304	1.501	-15.1	114	0.00	6.10	
66 I	Phenanthrene-d10	1.000	1.000	0.0	99	0.00	7.96	
67 T	4,6-Dinitro-2-methylphenol		-----True-----	Calc.	% Drift			
			-----NA-----					
68 C	n-Nitrosodiphenylamine	0.498	0.494	0.8	101	0.00	7.17	
69 T	1,2-Diphenylhydrazine	0.612	0.653	-6.7	108	0.00	7.20	
70 S	2,4,6-Tribromophenol		-----NA-----					
71 T	4-Bromophenyl-phenylether	0.233	0.241	-3.4	102	0.00	7.51	
72 T	Hexachlorobenzene	0.259	0.290	-12.0	112	0.00	7.67	
73 C	Pentachlorophenol		-----True-----	Calc.	% Drift			
			-----NA-----					
74 T	Phenanthrene	1.029	1.108	-7.8	108	0.00	7.98	
75 T	Anthracene	1.060	1.114	-5.1	104	0.00	8.03	
76 T	Carbazole	0.928	0.986	-6.3	104	0.00	8.19	
77 T	Di-n-butylphthalate	1.049	1.076	-2.6	101	0.00	8.60	
78 C	Fluoranthene	1.191	1.332	-11.8	108	0.00	9.25	
79	Atrazine		-----NA-----					

Initial Calibration Verification

Job Number: JB37147

Sample: MSF2937-ICV2937

Account: ALNJ Accutest New Jersey

Lab FileID: F62780.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

80	I	Chrysene-d12	1.000	1.000	0.0	99	0.00	10.74
81	T	Benzidine		-----NA-----				
82	M	Pyrene	1.143	1.232	-7.8	106	0.00	9.49
83	S	Terphenyl-d14	0.873	0.908	-4.0	102	0.00	9.66
84		3,3-Dimethylbenzidine		-----NA-----				
85	T	Butylbenzylphthalate	0.382	0.399	-4.5	102	0.00	10.20
86	T	3,3'-Dichlorobenzidine		-----NA-----				
87	T	Benzo[a]anthracene	1.012	1.132	-11.9	110	0.00	10.72
88	T	Chrysene	1.012	1.072	-6.0	104	0.00	10.76
89	T	bis(2-Ethylhexyl)phthalat	0.531	0.548	-3.2	103	0.00	10.82
90	I	Perylene-d12	1.000	1.000	0.0	97	0.00	12.22
91	C	Di-n-octylphthalate	0.922	1.051	-14.0	114	0.00	11.46
92	T	Benzo[b]fluoranthene	1.199	1.282	-7.0	98	0.00	11.84
93	T	Benzo[k]fluoranthene	1.088	1.232	-13.2	116	0.00	11.87
94	C	Benzo[a]pyrene	1.082	1.026	5.1	90	0.00	12.16
95	T	Indeno[1,2,3-cd]pyrene	1.287	1.372	-6.6	102	0.00	13.30
96	T	Dibenz[a,h]anthracene	1.075	1.160	-8.0	106	0.00	13.32
97	T	Benzo[g,h,i]perylene	1.053	1.184	-12.4	110	0.00	13.60

(47.5 %) 29 of 61 compounds '%D > 20

(#= Out of Range
f62777.D F130408_8270+.m)SPCC's out = 1 CCC's out = 10
Mon Apr 08 13:07:10 2013 R1

Initial Calibration Verification

Job Number: JB37147

Sample: MSF2937-ICV2937

Account: ALNJ Accutest New Jersey

Lab FileID: F62781.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\F130408\f62781.D Vial: 9
 Acq On : 8 Apr 2013 1:07 pm Operator: KRISTINR
 Sample : ICV2937-50 Inst : MSF
 Misc : op32443,msf2937,1000,,,1,1 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : C:\msdchem\1\MET...\F130408_8270+.m (RTE Integrator)
 Title : SW-864 Method 8270
 Last Update : Mon Apr 08 13:02:18 2013
 Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)R.T.
1 I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	159	0.00
2	N-nitrosodimethylamine		-----NA-----			
3 T	Pyridine		-----NA-----			
4 T	Methyl Methanesulfonate		-----NA-----			
5 T	Ethyl Methanesulfonate		-----NA-----			
6 T	Aniline		-----NA-----			
7 S	2-Fluorophenol	1.157	1.249	-8.0	160	0.00
8 T	bis(2-Chloroethyl)ether		-----NA-----			
9 S	Phenol-d5	1.474	1.519	-3.1	158	0.00
10 C	Phenol	1.626	1.666	-2.5	156	0.00
11 M	2-Chlorophenol	1.271	1.364	-7.3	165	0.00
12 T	1,3-Dichlorobenzene		-----NA-----			
13 C	1,4-Dichlorobenzene		-----NA-----			
14 T	1,2-Dichlorobenzene		-----NA-----			
15 T	Benzyl alcohol		-----NA-----			
16 T	bis(2-chloroisopropyl)eth		-----NA-----			
17 T	o-cresol	1.230	1.219	0.9	151	0.00
18 T	Acetophenone		-----NA-----			
19 T	Hexachloroethane		-----NA-----			
20 P	N-Nitroso-di-n-propylamin		-----NA-----			
21 T	m+p-cresols	1.249	1.311	-5.0	165	0.00
22	4-methylphenol	1.249	1.311	-5.0	165	0.00
23	Benzaldehyde		-----NA-----			
24 I	Naphthalene-d8	1.000	1.000	0.0	161	0.00
25 S	Nitrobenzene-d5		-----NA-----			
26 T	Nitrobenzene		-----NA-----			
27 T	Isophorone		-----NA-----			
28 C	2-Nitrophenol	0.190	0.207	-8.9	170	0.00
29 T	2,4-Dimethylphenol	0.375	0.313	16.5	133	0.00
30 T	bis(2-Chloroethoxy)methan		-----NA-----			
31 T	Benzoic acid	50.000	42.771	14.5	138	0.00
32 C	2,4-Dichlorophenol		-----NA-----			
33 M	1,2,4-Trichlorobenzene		-----NA-----			
34 T	Naphthalene		-----NA-----			
35 T	2,6-Dichlorophenol	0.309	0.317	-2.6	163	0.00
36 T	4-Chloroaniline		-----NA-----			
37 C	Hexachlorobutadiene		-----NA-----			

9.7.3

9

Initial Calibration Verification

Job Number: JB37147

Sample: MSF2937-ICV2937

Account: ALNJ Accutest New Jersey

Lab FileID: F62781.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

38 C	4-Chloro-3-methylphenol	0.315	0.339	-7.6	169	0.00	5.60
39 T	2-Methylnaphthalene		-----	NA			
40 T	1-Methylnaphthalene		-----	NA			
41 T	1,2,4,5-Tetrachlorobenzene		-----	NA			
42	Caprolactam		-----	NA			
43 I	Acenaphthene-d10	1.000	1.000	0.0	155	0.00	6.60
44 T	Pentachloronitrobenzene		-----	NA			
45 P	Hexachlorocyclopentadiene	True	Calc.	% Drift	-----		
		AvgRF	CCRF	% Dev	-----		
46 C	2,4,6-Trichlorophenol	0.381	0.432	-13.4	168	0.00	5.97
47 T	2,4,5-Trichlorophenol	0.418	0.488	-16.7	171	0.00	6.00
48 S	2-Fluorobiphenyl		-----	NA			
49 T	2-Chloronaphthalene		-----	NA			
50 M	Acenaphthylene		-----	NA			
51 T	Dimethylphthalate		-----	NA			
52 T	2,4-Dinitrotoluene		-----	NA			
53 C	Acenaphthene		-----	NA			
54 P	2,4-Dinitrophenol	True	Calc.	% Drift	-----		
		50.000	54.450	-8.9	166	0.00	6.66
55 T	Dibenzofuran	-----	AvgRF	CCRF	% Dev	-----	
56 M	2,6-Dinitrotoluene		-----	NA			
57 P	4-Nitrophenol	0.198	0.230	-16.2	159	0.00	6.71
58 T	2,3,4,6-Tetrachlorophenol	0.344	0.398	-15.7	171	0.00	6.91
59 T	Fluorene		-----	NA			
60 T	4-Chlorophenyl-phenylether		-----	NA			
61 T	Diethylphthalate		-----	NA			
62 T	2-nitroaniline		-----	NA			
63 T	3-nitroaniline		-----	NA			
64 T	4-nitroaniline		-----	NA			
65	1,1'-Biphenyl		-----	NA			
66 I	Phenanthrene-d10	1.000	1.000	0.0	159	0.00	7.96
67 T	4,6-Dinitro-2-methylpheno	True	Calc.	% Drift	-----		
		50.000	49.978	0.0	166	0.00	7.15
68 C	n-Nitrosodiphenylamine	-----	AvgRF	CCRF	% Dev	-----	
69 T	1,2-Diphenylhydrazine		-----	NA			
70 S	2,4,6-Tribromophenol	0.111	0.122	-9.9	166	0.00	7.31
71 T	4-Bromophenyl-phenylether		-----	NA			
72 T	Hexachlorobenzene		-----	NA			
73 C	Pentachlorophenol	True	Calc.	% Drift	-----		
		50.000	58.880	-17.8	190	0.00	7.84
74 T	Phenanthrene	-----	AvgRF	CCRF	% Dev	-----	
75 T	Anthracene		-----	NA			
76 T	Carbazole		-----	NA			
77 T	Di-n-butylphthalate		-----	NA			
78 C	Fluoranthene		-----	NA			
79	Atrazine		-----	NA			

Initial Calibration Verification

Job Number: JB37147

Sample: MSF2937-ICV2937

Account: ALNJ Accutest New Jersey

Lab FileID: F62781.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

80	I	Chrysene-d12	1.000	1.000	0.0	156	0.00	10.74
81	T	Benzidine		-----	-NA	-----		
82	M	Pyrene		-----	-NA	-----		
83	S	Terphenyl-d14		-----	-NA	-----		
84		3,3-Dimethylbenzidine		-----	-NA	-----		
85	T	Butylbenzylphthalate		-----	-NA	-----		
86	T	3,3'-Dichlorobenzidine		-----	-NA	-----		
87	T	Benzo[a]anthracene		-----	-NA	-----		
88	T	Chrysene		-----	-NA	-----		
89	T	bis(2-Ethylhexyl)phthalat		-----	-NA	-----		
90	I	Perylene-d12	1.000	1.000	0.0	157	0.00	12.22
91	C	Di-n-octylphthalate		-----	-NA	-----		
92	T	Benzo[b]fluoranthene		-----	-NA	-----		
93	T	Benzo[k]fluoranthene		-----	-NA	-----		
94	C	Benzo[a]pyrene		-----	-NA	-----		
95	T	Indeno[1,2,3-cd]pyrene		-----	-NA	-----		
96	T	Dibenz[a,h]anthracene		-----	-NA	-----		
97	T	Benzo[g,h,i]perylene		-----	-NA	-----		

(0.0 %) 0 of 20 compounds '%D > 20

(#= Out of Range
f62778.D F130408_8270+.mSPCC's out = 1 CCC's out = 8
Tue Apr 09 10:19:42 2013 R19.7.3
9

Initial Calibration Verification

Job Number: JB37147

Sample: MSF2937-ICV2937

Account: ALNJ Accutest New Jersey

Lab FileID: F62782.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\F130408\f62782.D Vial: 10
 Acq On : 8 Apr 2013 1:32 pm Operator: KRISTINR
 Sample : ICV2937-20 Inst : MSF
 Misc : op32443,msf2937,1000,,,1,1 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : C:\msdchem\1\MET...\F130408_8270+.m (RTE Integrator)
 Title : SW-864 Method 8270
 Last Update : Mon Apr 08 13:02:18 2013
 Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1 I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	86	0.00	4.16
2 S	N-nitrosodimethylamine		-----NA-----				
3 T	Pyridine		-----NA-----				
4 T	Methyl Methanesulfonate		-----NA-----				
5 T	Ethyl Methanesulfonate		-----NA-----				
6 T	Aniline	0.833	0.740	11.2	73	0.00	3.94
7 S	2-Fluorophenol		-----NA-----				
8 T	bis(2-Chloroethyl)ether		-----NA-----				
9 S	Phenol-d5		-----NA-----				
10 C	Phenol		-----NA-----				
11 M	2-Chlorophenol		-----NA-----				
12 T	1,3-Dichlorobenzene		-----NA-----				
13 C	1,4-Dichlorobenzene		-----NA-----				
14 T	1,2-Dichlorobenzene		-----NA-----				
15 T	Benzyl alcohol		-----NA-----				
16 T	bis(2-chloroisopropyl)eth		-----NA-----				
17 T	o-cresol		-----NA-----				
18 T	Acetophenone		-----NA-----				
19 T	Hexachloroethane		-----NA-----				
20 P	N-Nitroso-di-n-propylamin		-----NA-----				
21 T	m+p-cresols		-----NA-----				
22	4-methylphenol		-----NA-----				
23	Benzaldehyde		-----NA-----				
24 I	Naphthalene-d8	1.000	1.000	0.0	86	0.00	5.15
25 S	Nitrobenzene-d5		-----NA-----				
26 T	Nitrobenzene		-----NA-----				
27 T	Isophorone		-----NA-----				
28 C	2-Nitrophenol		-----NA-----				
29 T	2,4-Dimethylphenol		-----NA-----				
30 T	bis(2-Chloroethoxy)methan		-----NA-----				
31 T	Benzoic acid		-----True-----	Calc.	% Drift		
32 C	2,4-Dichlorophenol		-----AvgRF-----	CCRF	% Dev		
33 M	1,2,4-Trichlorobenzene			-----NA-----			
34 T	Naphthalene			-----NA-----			
35 T	2,6-Dichlorophenol			-----NA-----			
36 T	4-Chloroaniline	0.432		0.401	7.2	78	0.00
37 C	Hexachlorobutadiene			-----NA-----			5.22

Initial Calibration Verification

Job Number: JB37147

Sample: MSF2937-ICV2937

Account: ALNJ Accutest New Jersey

Lab FileID: F62782.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

38 C	4-Chloro-3-methylphenol	-----	NA-----						
39 T	2-Methylnaphthalene	-----	NA-----						
40 T	1-Methylnaphthalene	-----	NA-----						
41 T	1,2,4,5-Tetrachlorobenzene	-----	NA-----						
42	Caprolactam	-----	NA-----						
43 I	Acenaphthene-d10	1.000	1.000	0.0	84	0.00	6.60		
44 T	Pentachloronitrobenzene	-----	NA-----						
	-----	True	Calc.	% Drift	-----				
45 P	Hexachlorocyclopentadiene	-----	NA-----						
	-----	AvgRF	CCRF	% Dev	-----				
46 C	2,4,6-Trichlorophenol	-----	NA-----						
47 T	2,4,5-Trichlorophenol	-----	NA-----						
48 S	2-Fluorobiphenyl	-----	NA-----						
49 T	2-Chloronaphthalene	-----	NA-----						
50 M	Acenaphthylene	-----	NA-----						
51 T	Dimethylphthalate	-----	NA-----						
52 T	2,4-Dinitrotoluene	-----	NA-----						
53 C	Acenaphthene	-----	NA-----						
	-----	True	Calc.	% Drift	-----				
54 P	2,4-Dinitrophenol	-----	NA-----						
	-----	AvgRF	CCRF	% Dev	-----				
55 T	Dibenzofuran	-----	NA-----						
56 M	2,6-Dinitrotoluene	-----	NA-----						
57 P	4-Nitrophenol	-----	NA-----						
58 T	2,3,4,6-Tetrachlorophenol	-----	NA-----						
59 T	Fluorene	-----	NA-----						
60 T	4-Chlorophenyl-phenylether	-----	NA-----						
61 T	Diethylphthalate	-----	NA-----						
62 T	2-nitroaniline	-----	NA-----						
63 T	3-nitroaniline	-----	NA-----						
64 T	4-nitroaniline	-----	NA-----						
65	1,1'-Biphenyl	-----	NA-----						
66 I	Phenanthrene-d10	1.000	1.000	0.0	82	0.00	7.96		
	-----	True	Calc.	% Drift	-----				
67 T	4,6-Dinitro-2-methylpheno	-----	NA-----						
	-----	AvgRF	CCRF	% Dev	-----				
68 C	n-Nitrosodiphenylamine	-----	NA-----						
69 T	1,2-Diphenylhydrazine	-----	NA-----						
70 S	2,4,6-Tribromophenol	-----	NA-----						
71 T	4-Bromophenyl-phenylether	-----	NA-----						
72 T	Hexachlorobenzene	-----	NA-----						
	-----	True	Calc.	% Drift	-----				
73 C	Pentachlorophenol	-----	NA-----						
	-----	AvgRF	CCRF	% Dev	-----				
74 T	Phenanthrene	-----	NA-----						
75 T	Anthracene	-----	NA-----						
76 T	Carbazole	-----	NA-----						
77 T	Di-n-butylphthalate	-----	NA-----						
78 C	Fluoranthene	-----	NA-----						
79	Atrazine	-----	NA-----						

9.7.4
9

Initial Calibration Verification

Job Number: JB37147

Sample: MSF2937-ICV2937

Account: ALNJ Accutest New Jersey

Lab FileID: F62782.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

80	I	Chrysene-d12	1.000	1.000	0.0	85	0.00	10.74
81	T	Benzidine	0.428	0.583	-36.2#	112	0.00	9.39
82	M	Pyrene			-----	NA		
83	S	Terphenyl-d14			-----	NA		
84		3,3'-Dimethylbenzidine			-----	NA		
85	T	Butylbenzylphthalate			-----	NA		
86	T	3,3'-Dichlorobenzidine	0.386	0.373	3.4	84	0.00	10.71
87	T	Benzo[a]anthracene			-----	NA		
88	T	Chrysene			-----	NA		
89	T	bis(2-Ethylhexyl)phthalat			-----	NA		
90	I	Perylene-d12	1.000	1.000	0.0	88	0.00	12.22
91	C	Di-n-octylphthalate			-----	NA		
92	T	Benzo[b]fluoranthene			-----	NA		
93	T	Benzo[k]fluoranthene			-----	NA		
94	C	Benzo[a]pyrene			-----	NA		
95	T	Indeno[1,2,3-cd]pyrene			-----	NA		
96	T	Dibenz[a,h]anthracene			-----	NA		
97	T	Benzo[g,h,i]perylene			-----	NA		

(25.0 %) 1 of 4 compounds '%D > 20

(#= Out of Range
f62777.D F130408_8270+.mSPCC's out = 2 CCC's out = 13
Tue Apr 09 10:21:25 2013 R19.7.4
9

Initial Calibration Verification

Job Number: JB37147

Sample: MSF2937-ICV2937

Account: ALNJ Accutest New Jersey

Lab FileID: F62783.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\F130408\f62783.D Vial: 11
 Acq On : 8 Apr 2013 1:57 pm Operator: KRISTINR
 Sample : ICV2937-20 Inst : MSF
 Misc : op32443,msf2937,1000,,,1,1 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : C:\msdchem\1\MET...\F130408_8270+.m (RTE Integrator)
 Title : SW-864 Method 8270
 Last Update : Mon Apr 08 13:02:18 2013
 Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1 I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	110	0.00	4.16
2 S	N-nitrosodimethylamine		-----NA-----				
3 T	Pyridine		-----NA-----				
4 T	Methyl Methanesulfonate		-----NA-----				
5 T	Ethyl Methanesulfonate		-----NA-----				
6 T	Aniline		-----NA-----				
7 S	2-Fluorophenol		-----NA-----				
8 T	bis(2-Chloroethyl)ether		-----NA-----				
9 S	Phenol-d5		-----NA-----				
10 C	Phenol		-----NA-----				
11 M	2-Chlorophenol		-----NA-----				
12 T	1,3-Dichlorobenzene		-----NA-----				
13 C	1,4-Dichlorobenzene		-----NA-----				
14 T	1,2-Dichlorobenzene		-----NA-----				
15 T	Benzyl alcohol		-----NA-----				
16 T	bis(2-chloroisopropyl)eth		-----NA-----				
17 T	o-cresol		-----NA-----				
18 T	Acetophenone		-----NA-----				
19 T	Hexachloroethane		-----NA-----				
20 P	N-Nitroso-di-n-propylamin		-----NA-----				
21 T	m+p-cresols		-----NA-----				
22	4-methylphenol		-----NA-----				
23	Benzaldehyde	3.974	2.854	28.2#	79	0.00	4.48
24 I	Naphthalene-d8	1.000	1.000	0.0	110	0.00	5.15
25 S	Nitrobenzene-d5		-----NA-----				
26 T	Nitrobenzene		-----NA-----				
27 T	Isophorone		-----NA-----				
28 C	2-Nitrophenol		-----NA-----				
29 T	2,4-Dimethylphenol		-----NA-----				
30 T	bis(2-Chloroethoxy)methan		-----NA-----				
31 T	Benzoic acid		-----True-----	Calc.	% Drift		
32 C	2,4-Dichlorophenol		-----AvgRF-----	CCRF	% Dev		
33 M	1,2,4-Trichlorobenzene			-----NA-----			
34 T	Naphthalene			-----NA-----			
35 T	2,6-Dichlorophenol			-----NA-----			
36 T	4-Chloroaniline			-----NA-----			
37 C	Hexachlorobutadiene			-----NA-----			

Initial Calibration Verification

Job Number: JB37147

Sample: MSF2937-ICV2937

Account: ALNJ Accutest New Jersey

Lab FileID: F62783.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

38 C	4-Chloro-3-methylphenol		-----	NA	-----		
39 T	2-Methylnaphthalene		-----	NA	-----		
40 T	1-Methylnaphthalene		-----	NA	-----		
41 T	1,2,4,5-Tetrachlorobenzene		-----	NA	-----		
42	Caprolactam	0.115	0.117	-1.7	111	0.00	5.45
43 I	Acenaphthene-d10	1.000	1.000	0.0	109	0.00	6.60
44 T	Pentachloronitrobenzene		-----	NA	-----		
		-----	True	Calc.	% Drift	-----	
45 P	Hexachlorocyclopentadiene		-----	NA	-----		
		-----	AvgRF	CCRF	% Dev	-----	
46 C	2,4,6-Trichlorophenol		-----	NA	-----		
47 T	2,4,5-Trichlorophenol		-----	NA	-----		
48 S	2-Fluorobiphenyl		-----	NA	-----		
49 T	2-Chloronaphthalene		-----	NA	-----		
50 M	Acenaphthylene		-----	NA	-----		
51 T	Dimethylphthalate		-----	NA	-----		
52 T	2,4-Dinitrotoluene		-----	NA	-----		
53 C	Acenaphthene		-----	NA	-----		
		-----	True	Calc.	% Drift	-----	
54 P	2,4-Dinitrophenol		-----	NA	-----		
		-----	AvgRF	CCRF	% Dev	-----	
55 T	Dibenzofuran		-----	NA	-----		
56 M	2,6-Dinitrotoluene		-----	NA	-----		
57 P	4-Nitrophenol		-----	NA	-----		
58 T	2,3,4,6-Tetrachlorophenol		-----	NA	-----		
59 T	Fluorene		-----	NA	-----		
60 T	4-Chlorophenyl-phenylether		-----	NA	-----		
61 T	Diethylphthalate		-----	NA	-----		
62 T	2-nitroaniline		-----	NA	-----		
63 T	3-nitroaniline		-----	NA	-----		
64 T	4-nitroaniline		-----	NA	-----		
65	1,1'-Biphenyl	1.304	1.422	-9.0	116	0.00	6.10
66 I	Phenanthrene-d10	1.000	1.000	0.0	109	0.00	7.96
		-----	True	Calc.	% Drift	-----	
67 T	4,6-Dinitro-2-methylphenol		-----	NA	-----		
		-----	AvgRF	CCRF	% Dev	-----	
68 C	n-Nitrosodiphenylamine		-----	NA	-----		
69 T	1,2-Diphenylhydrazine		-----	NA	-----		
70 S	2,4,6-Tribromophenol		-----	NA	-----		
71 T	4-Bromophenyl-phenylether		-----	NA	-----		
72 T	Hexachlorobenzene		-----	NA	-----		
		-----	True	Calc.	% Drift	-----	
73 C	Pentachlorophenol		-----	NA	-----		
		-----	AvgRF	CCRF	% Dev	-----	
74 T	Phenanthrene		-----	NA	-----		
75 T	Anthracene		-----	NA	-----		
76 T	Carbazole		-----	NA	-----		
77 T	Di-n-butylphthalate		-----	NA	-----		
78 C	Fluoranthene		-----	NA	-----		
79	Atrazine	0.199	0.207	-4.0	114	0.00	7.69

Initial Calibration Verification

Job Number: JB37147

Sample: MSF2937-ICV2937

Account: ALNJ Accutest New Jersey

Lab FileID: F62783.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

80	I	Chrysene-d12	1.000	1.000	0.0	112	0.00	10.74
81	T	Benzidine		-----	-NA	-----		
82	M	Pyrene		-----	-NA	-----		
83	S	Terphenyl-d14		-----	-NA	-----		
84		3,3-Dimethylbenzidine		-----	-NA	-----		
85	T	Butylbenzylphthalate		-----	-NA	-----		
86	T	3,3'-Dichlorobenzidine		-----	-NA	-----		
87	T	Benzo[a]anthracene		-----	-NA	-----		
88	T	Chrysene		-----	-NA	-----		
89	T	bis(2-Ethylhexyl)phthalat		-----	-NA	-----		
90	I	Perylene-d12	1.000	1.000	0.0	112	0.00	12.22
91	C	Di-n-octylphthalate		-----	-NA	-----		
92	T	Benzo[b]fluoranthene		-----	-NA	-----		
93	T	Benzo[k]fluoranthene		-----	-NA	-----		
94	C	Benzo[a]pyrene		-----	-NA	-----		
95	T	Indeno[1,2,3-cd]pyrene		-----	-NA	-----		
96	T	Dibenz[a,h]anthracene		-----	-NA	-----		
97	T	Benzo[g,h,i]perylene		-----	-NA	-----		

(25.0 %) 1 of 4 compounds '%D > 20

(#= Out of Range
f62777.D F130408_8270+.mSPCC's out = 2 CCC's out = 13
Tue Apr 09 10:22:41 2013 R19.7.5
9

Continuing Calibration Summary

Job Number: JB37147

Sample: MSF3012-CC2937

Account: ALNJ Accutest New Jersey

Lab FileID: F64578.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : F:\1\DATA\F130529\F64578.D Vial: 100
 Acq On : 29 May 2013 4:07 pm Operator: kristinr
 Sample : CC2937-50 Inst : MSF
 Misc : OP33186,MSF3012,,,1,1 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : F:\1\METHODS\F13..._8270+.E.02.01.m (RTE Integrator)
 Title : SW-864 Method 8270
 Last Update : Thu May 16 08:36:15 2013
 Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)R.T.	
1 I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	164	-0.09	
2	N-nitrosodimethylamine	0.764	0.693	9.3	143	-0.35	
3 T	Pyridine	1.467	1.250	14.8	138	-0.37	
4 T	Methyl Methanesulfonate	0.654	0.707	-8.1	167	-0.23	
5 T	Ethyl Methanesulfonate	0.927	0.966	-4.2	171	-0.15	
6 T	Aniline	0.833	0.621	25.5#	117	-0.10	
7 S	2-Fluorophenol	1.157	1.145	1.0	151	-0.21	
8 T	bis(2-Chloroethyl)ether	0.858	0.892	-4.0	167	-0.10	
9 S	Phenol-d5	1.474	1.498	-1.6	161	-0.09	
10 C	Phenol	1.626	1.728	-6.3	166	-0.08	
11 M	2-Chlorophenol	1.271	1.244	2.1	155	-0.10	
12 T	1,3-Dichlorobenzene	1.465	1.411	3.7	157	-0.10	
13 C	1,4-Dichlorobenzene	1.574	1.500	4.7	159	-0.08	
14 T	1,2-Dichlorobenzene	1.389	1.366	1.7	154	-0.06	
15 T	Benzyl alcohol			-----NA-----			
16 T	bis(2-chloroisopropyl)eth	1.127	1.128	-0.1	163	-0.03	
17 T	o-cresol	1.230	1.335	-8.5	170	-0.01	
18 T	Acetophenone	1.822	1.894	-4.0	167	-0.02	
19 T	Hexachloroethane	0.549	0.566	-3.1	169	-0.03	
20 P	N-Nitroso-di-n-propylamin	0.917	0.979	-6.8	168	-0.01	
21 T	m+p-cresols	1.249	1.341	-7.4	174	0.01	
22	4-methylphenol	1.249	1.348	-7.9	175	0.01	
23	Benzaldehyde	3.974	4.508	-13.4	184	-0.02	
24 I	Naphthalene-d8	1.000	1.000	0.0	167	-0.09	
25 S	Nitrobenzene-d5	0.357	0.392	-9.8	170	-0.16	
26 T	Nitrobenzene	0.380	0.403	-6.1	174	-0.16	
27 T	Isophorone	0.582	0.597	-2.6	165	-0.13	
28 C	2-Nitrophenol	0.190	0.192	-1.1	164	-0.12	
29 T	2,4-Dimethylphenol	0.375	0.369	1.6	162	-0.08	
30 T	bis(2-Chloroethoxy)methan	0.379	0.376	0.8	159	-0.08	
31 T	Benzoic acid	50.000	60.194	-----			
		Amount	Calc.	%Drift			
				-20.4#	216	-0.04	
32 C	2,4-Dichlorophenol	0.299	0.303	-1.3	160	-0.08	
33 M	1,2,4-Trichlorobenzene	0.352	0.344	2.3	163	-0.09	
34 T	Naphthalene	0.998	0.953	4.5	158	-0.09	
35 T	2,6-Dichlorophenol	0.309	0.296	4.2	157	-0.06	
36 T	4-Chloroaniline	0.432	0.421	2.5	155	-0.05	
37 C	Hexachlorobutadiene	0.228	0.235	-3.1	166	-0.05	

Continuing Calibration Summary

Page 2 of 3

Job Number: JB37147

Sample: MSF3012-CC2937

Account: ALNJ Accutest New Jersey

Lab FileID: F64578.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

38 C	4-Chloro-3-methylphenol	0.315	0.326	-3.5	168	0.04	5.46
39 T	2-Methylnaphthalene	0.691	0.685	0.9	164	0.00	5.52
40 T	1-Methylnaphthalene	0.666	0.654	1.8	162	0.00	5.62
41 T	1,2,4,5-Tetrachlorobenzene	0.415	0.419	-1.0	167	0.03	5.71
42	Caprolactam	0.115	0.125	-8.7	176	-0.02	5.28
43 I	Acenaphthene-d10	1.000	1.000	0.0	173	-0.09	6.50
44 T	Pentachloronitrobenzene	0.173	0.185	-6.9	177	-0.05	7.87
45 P	Hexachlorocyclopentadiene	100.000	73.215	26.8#	128	-0.16	5.73
46 C	2,4,6-Trichlorophenol	0.381	0.366	3.9	159	-0.14	5.82
47 T	2,4,5-Trichlorophenol	0.418	0.410	1.9	161	-0.13	5.87
48 S	2-Fluorobiphenyl	1.329	1.274	4.1	163	-0.14	5.88
49 T	2-Chloronaphthalene	1.043	1.030	1.2	165	-0.14	5.97
50 M	Acenaphthylene	1.730	1.656	4.3	160	-0.11	6.36
51 T	Dimethylphthalate	1.288	1.214	5.7	163	-0.08	6.30
52 T	2,4-Dinitrotoluene	0.377	0.381	-1.1	164	-0.05	6.74
53 C	Acenaphthene	1.102	1.050	4.7	163	-0.09	6.53
54 P	2,4-Dinitrophenol	50.000	53.551	-7.1	181	-0.06	6.61
55 T	Dibenzofuran	1.619	1.500	7.4	158	-0.08	6.67
56 M	2,6-Dinitrotoluene	0.287	0.285	0.7	164	-0.08	6.37
57 P	4-Nitrophenol	0.198	0.220	-11.1	170	0.00	6.74
58 T	2,3,4,6-Tetrachlorophenol	0.344	0.345	-0.3	166	-0.06	6.85
59 T	Fluorene	1.262	1.238	1.9	166	-0.07	7.00
60 T	4-Chlorophenyl-phenylethane	0.703	0.687	2.3	167	-0.05	7.00
61 T	Diethylphthalate	1.164	1.127	3.2	164	-0.03	6.96
62 T	2-nitroaniline	0.354	0.336	5.1	162	-0.11	6.11
63 T	3-nitroaniline	0.295	0.294	0.3	162	-0.07	6.50
64 T	4-nitroaniline	0.295	0.289	2.0	158	-0.04	7.08
65	1,1'-Biphenyl	1.304	1.315	-0.8	167	-0.13	5.96
66 I	Phenanthrene-d10	1.000	1.000	0.0	169	-0.10	7.90
67 T	4,6-Dinitro-2-methylphenol	50.000	47.084	5.8	165	-0.08	7.13
68 C	n-Nitrosodiphenylamine	0.498	0.483	3.0	160	-0.08	7.13
69 T	1,2-Diphenylhydrazine	0.612	0.720	-17.6	190	-0.08	7.15
70 S	2,4,6-Tribromophenol	0.111	0.117	-5.4	169	-0.10	7.24
71 T	4-Bromophenyl-phenylether	0.233	0.229	1.7	157	-0.09	7.46
72 T	Hexachlorobenzene	0.259	0.257	0.8	165	-0.10	7.61
73 C	Pentachlorophenol	50.000	49.815	0.4	167	-0.09	7.80
74 T	Phenanthrene	1.029	0.981	4.7	159	-0.11	7.92
75 T	Anthracene	1.060	1.025	3.3	158	-0.11	7.97
76 T	Carbazole	0.928	0.892	3.9	156	-0.09	8.16
77 T	Di-n-butylphthalate	1.049	1.075	-2.5	162	-0.06	8.60
78 C	Fluoranthene	1.191	1.169	1.8	158	-0.13	9.20
79	Atrazine	0.199	0.194	2.5	155	-0.06	7.69

9.7.6
9

Continuing Calibration Summary

Job Number: JB37147

Sample: MSF3012-CC2937

Account: ALNJ Accutest New Jersey

Lab FileID: F64578.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

80	I	Chrysene-d12	1.000	1.000	0.0	171	-0.10	10.70
81	T	Benzidine	0.428	0.299	30.1#	121	-0.05	9.36
82	M	Pyrene	1.143	1.065	6.8	155	-0.09	9.43
83	S	Terphenyl-d14	0.873	0.834	4.5	157	-0.07	9.63
84		3,3-Dimethylbenzidine	0.475	0.327	31.2#	144	-0.07	10.13
85	T	Butylbenzylphthalate	0.382	0.379	0.8	164	-0.06	10.19
86	T	3,3'-Dichlorobenzidine	0.386	0.394	-2.1	167	-0.08	10.69
87	T	Benzo[a]anthracene	1.012	0.949	6.2	156	-0.10	10.69
88	T	Chrysene	1.012	0.927	8.4	154	-0.10	10.73
89	T	bis(2-Ethylhexyl)phthalat	0.531	0.539	-1.5	165	-0.04	10.84
90	I	Perylene-d12	1.000	1.000	0.0	166	-0.11	12.18
91	C	Di-n-octylphthalate	0.922	1.002	-8.7	170	-0.09	11.49
92	T	Benzo[b]fluoranthene	1.199	1.201	-0.2	159	-0.11	11.82
93	T	Benzo[k]fluoranthene	1.088	1.045	4.0	158	-0.11	11.84
94	C	Benzo[a]pyrene	1.082	1.069	1.2	157	-0.11	12.14
95	T	Indeno[1,2,3-cd]pyrene	1.287	1.302	-1.2	167	-0.11	13.18
96	T	Dibenz[a,h]anthracene	1.075	1.082	-0.7	168	-0.11	13.19
97	T	Benzo[g,h,i]perylene	1.053	0.990	6.0	159	-0.12	13.40

(#) = Out of Range

SPCC's out = 0 CCC's out = 0

f63268.D F130408_8270+.E.02.01.m Thu Jun 06 17:07:14 2013

9.7.6
9



GC/MS Semi-volatiles

Raw Data

(Accutest Labs of New England, Inc.)

Quantitation Report (QT Reviewed)

Data Path : F:\1\DATA\F130529\
 Data File : F64584.D
 Acq On : 29 May 2013 6:26 pm
 Operator : kristinr
 Sample : JB37147-1
 Misc : OP33326,MSF3005,20.39,,,1,1
 ALS Vial : 24 Sample Multiplier: 1

Quant Time: Jun 11 11:06:50 2013
 Quant Method : F:\1\METHODS\F130408_8270+.E.02.01.m
 Quant Title : SW-864 Method 8270
 QLast Update : Thu May 16 08:36:15 2013
 Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
<hr/>						
Internal Standards						
1) 1,4-Dichlorobenzene-d4	3.755	152	43857	40.00	ppm	-0.09
24) Naphthalene-d8	4.871	136	166146	40.00	ppm	-0.09
43) Acenaphthene-d10	6.492	164	106398	40.00	ppm	-0.10
66) Phenanthrene-d10	7.896	188	191495	40.00	ppm	-0.11
80) Chrysene-d12	10.693	240	203519	40.00	ppm	-0.11
90) Perylene-d12	12.179	264	188788	40.00	ppm	-0.12
<hr/>						
System Monitoring Compounds						
7) 2-Fluorophenol	2.803	112	44272	34.91	ppm	-0.20
Spiked Amount 100.000	Range 30 - 130		Recovery =	34.91%		
9) Phenol-d5	3.538	99	54803	33.91	ppm	-0.08
Spiked Amount 100.000	Range 30 - 130		Recovery =	33.91%		
25) Nitrobenzene-d5	4.260	82	55921	37.71	ppm	-0.16
Spiked Amount 50.000	Range 30 - 130		Recovery =	75.42%		
48) 2-Fluorobiphenyl	5.881	172	123730	34.99	ppm	-0.14
Spiked Amount 50.000	Range 30 - 130		Recovery =	69.98%		
70) 2,4,6-Tribromophenol	7.244	330	19602	36.86	ppm	-0.10
Spiked Amount 100.000	Range 30 - 130		Recovery =	36.86%		
83) Terphenyl-d14	9.629	244	169556	38.18	ppm	-0.06
Spiked Amount 50.000	Range 30 - 130		Recovery =	76.36%		
<hr/>						
Target Compounds						
74) Phenanthrene	7.920	178	1868	0.38	ppm	98
82) Pyrene	9.430	202	1758	0.30	ppm	83

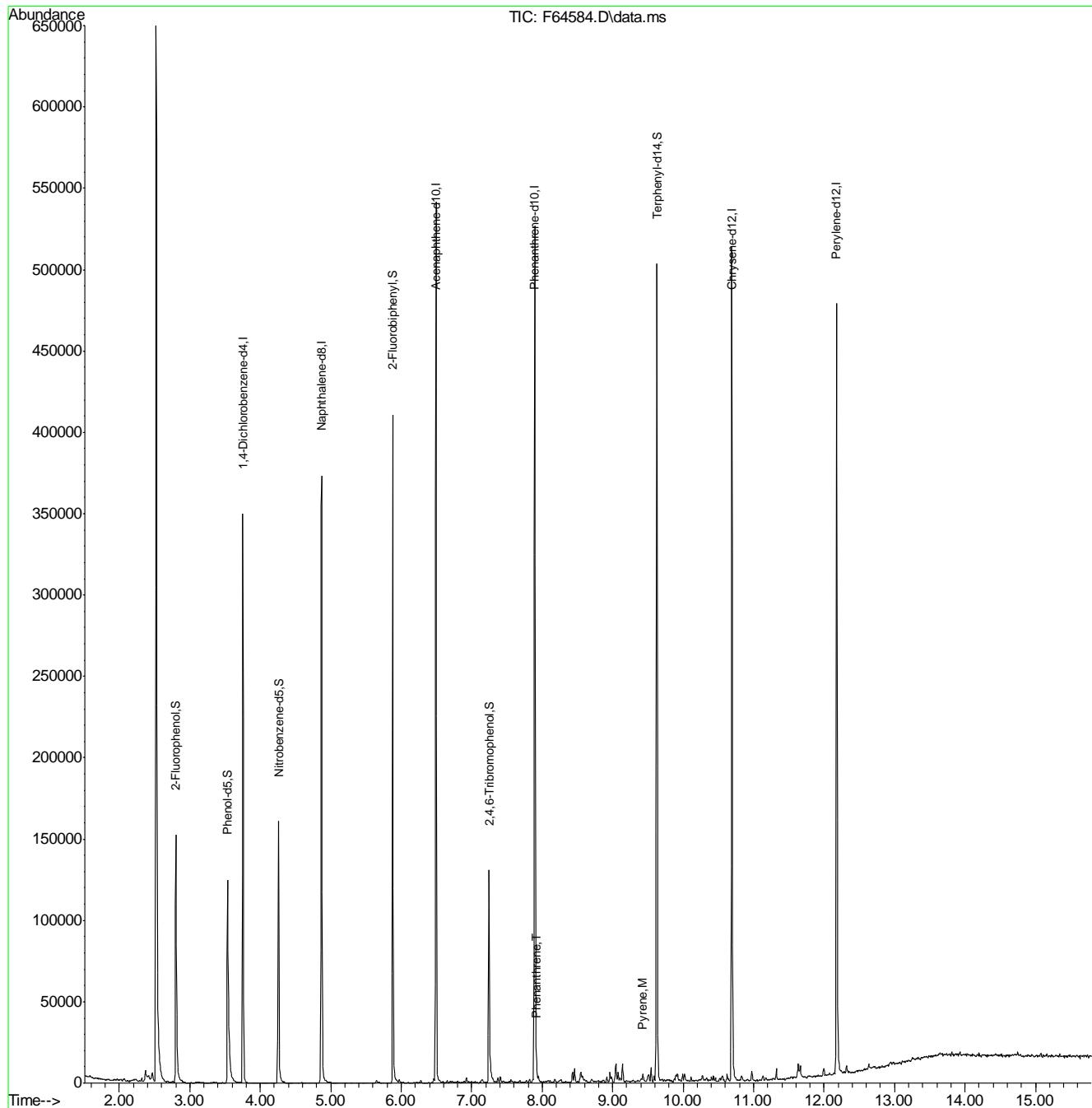
(#) = qualifier out of range (m) = manual integration (+) = signals summed

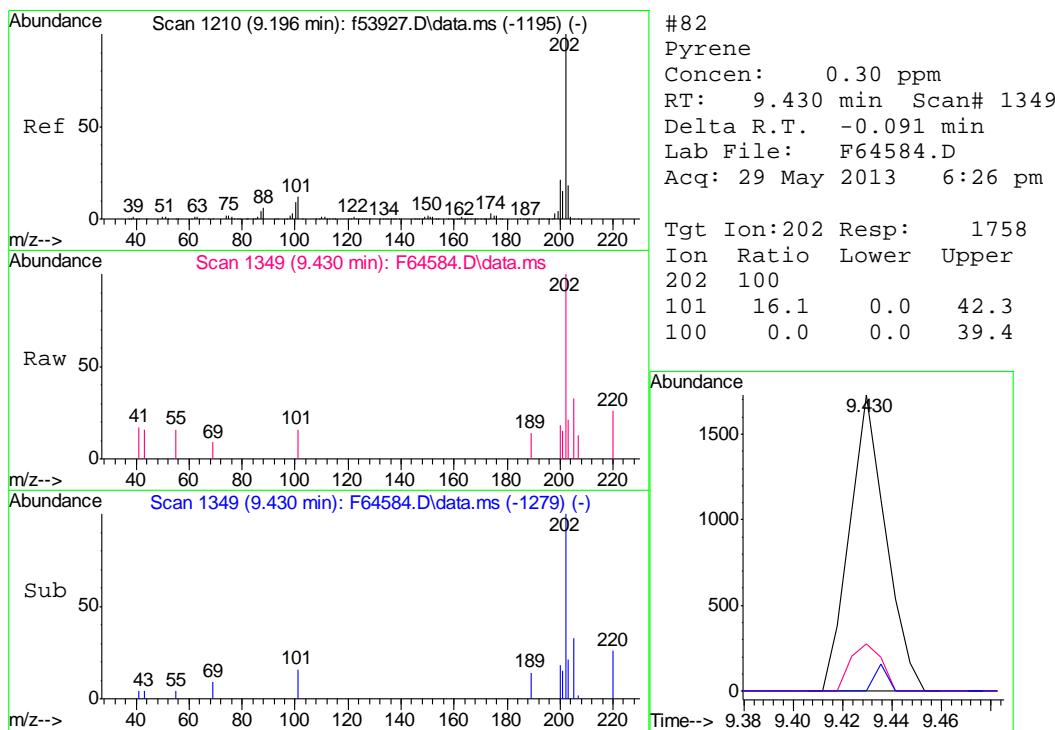
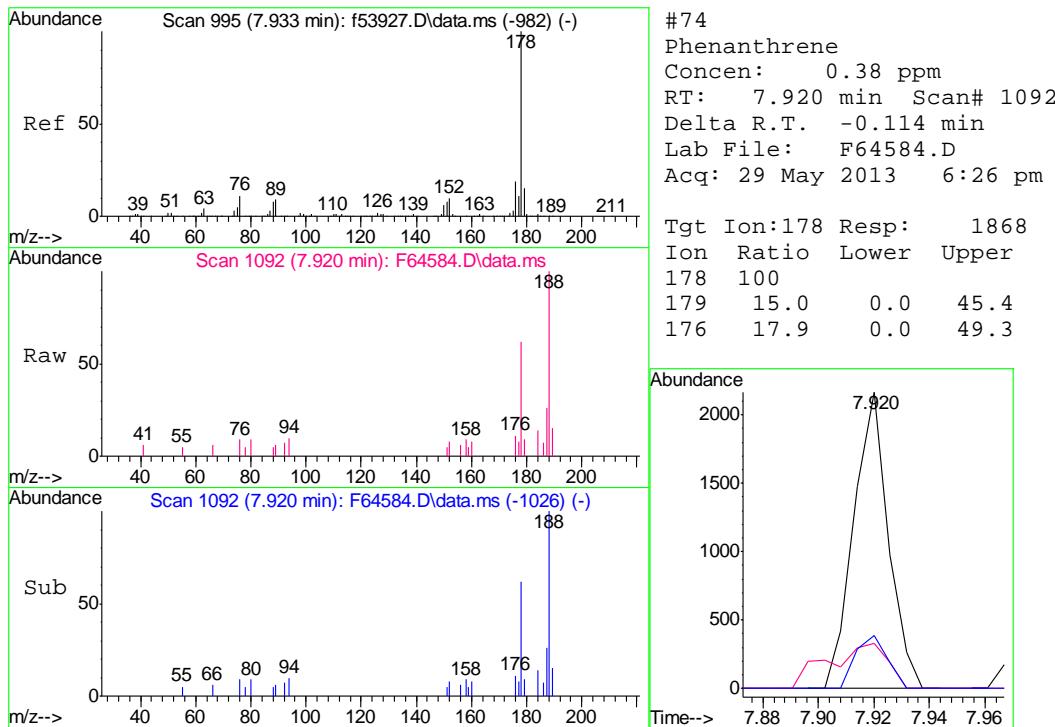
10.1.1
10

Quantitation Report (QT Reviewed)

Data Path : F:\1\DATA\F130529\
 Data File : F64584.D
 Acq On : 29 May 2013 6:26 pm
 Operator : kristinr
 Sample : JB37147-1
 Misc : OP33326,MSF3005,20.39,,,1,1
 ALS Vial : 24 Sample Multiplier: 1

Quant Time: Jun 11 11:06:50 2013
 Quant Method : F:\1\METHODS\F130408_8270+.E.02.01.m
 Quant Title : SW-864 Method 8270
 QLast Update : Thu May 16 08:36:15 2013
 Response via : Initial Calibration





Quantitation Report (QT Reviewed)

Data Path : F:\1\DATA\F130529\
 Data File : F64585.D
 Acq On : 29 May 2013 6:49 pm
 Operator : kristinr
 Sample : JB37147-2
 Misc : OP33326,MSF3005,10.39,,,1,1
 ALS Vial : 25 Sample Multiplier: 1

Quant Time: Jun 11 11:33:38 2013
 Quant Method : F:\1\METHODS\F130408_8270+.E.02.01.m
 Quant Title : SW-864 Method 8270
 QLast Update : Thu May 16 08:36:15 2013
 Response via : Initial Calibration

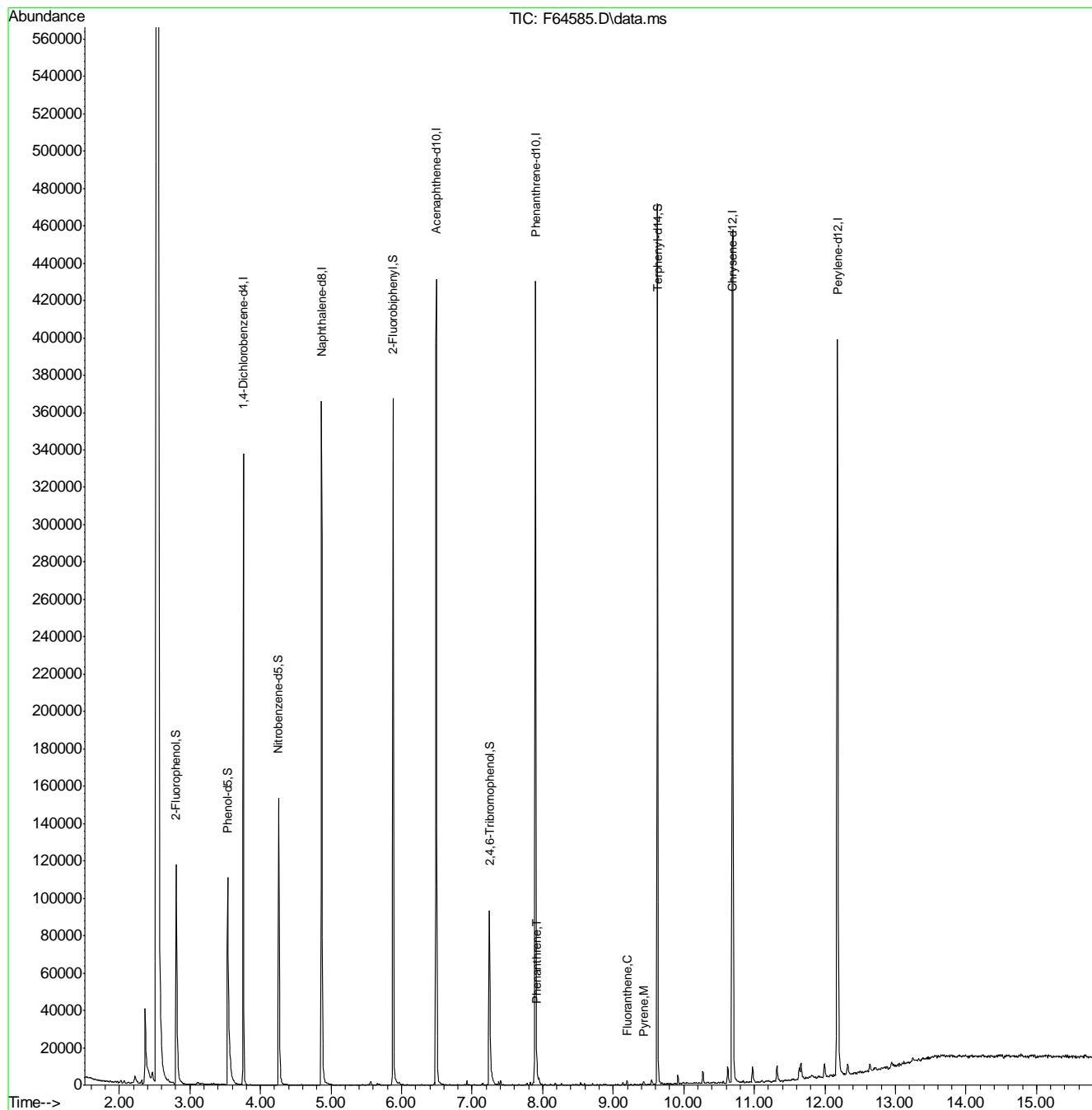
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
<hr/>						
Internal Standards						
1) 1,4-Dichlorobenzene-d4	3.756	152	40576	40.00	ppm	-0.09
24) Naphthalene-d8	4.867	136	150322	40.00	ppm	-0.09
43) Acenaphthene-d10	6.494	164	96970	40.00	ppm	-0.09
66) Phenanthrene-d10	7.898	188	172035	40.00	ppm	-0.11
80) Chrysene-d12	10.694	240	184162	40.00	ppm	-0.11
90) Perylene-d12	12.180	264	164506	40.00	ppm	-0.12
<hr/>						
System Monitoring Compounds						
7) 2-Fluorophenol	2.805	112	34576	29.47	ppm	-0.20
Spiked Amount 100.000	Range 30 - 130		Recovery =	29.47%#		
9) Phenol-d5	3.539	99	49946	33.40	ppm	-0.08
Spiked Amount 100.000	Range 30 - 130		Recovery =	33.40%		
25) Nitrobenzene-d5	4.256	82	51968	38.73	ppm	-0.16
Spiked Amount 50.000	Range 30 - 130		Recovery =	77.46%		
48) 2-Fluorobiphenyl	5.877	172	113175	35.12	ppm	-0.14
Spiked Amount 50.000	Range 30 - 130		Recovery =	70.24%		
70) 2,4,6-Tribromophenol	7.246	330	16836	35.24	ppm	-0.10
Spiked Amount 100.000	Range 30 - 130		Recovery =	35.24%		
83) Terphenyl-d14	9.625	244	156497	38.95	ppm	-0.07
Spiked Amount 50.000	Range 30 - 130		Recovery =	77.90%		
<hr/>						
Target Compounds				Qvalue		
74) Phenanthrene	7.915	178	1239	0.28	ppm	96
78) Fluoranthene	9.196	202	1403	0.27	ppm	65
82) Pyrene	9.431	202	1203	0.23	ppm	83

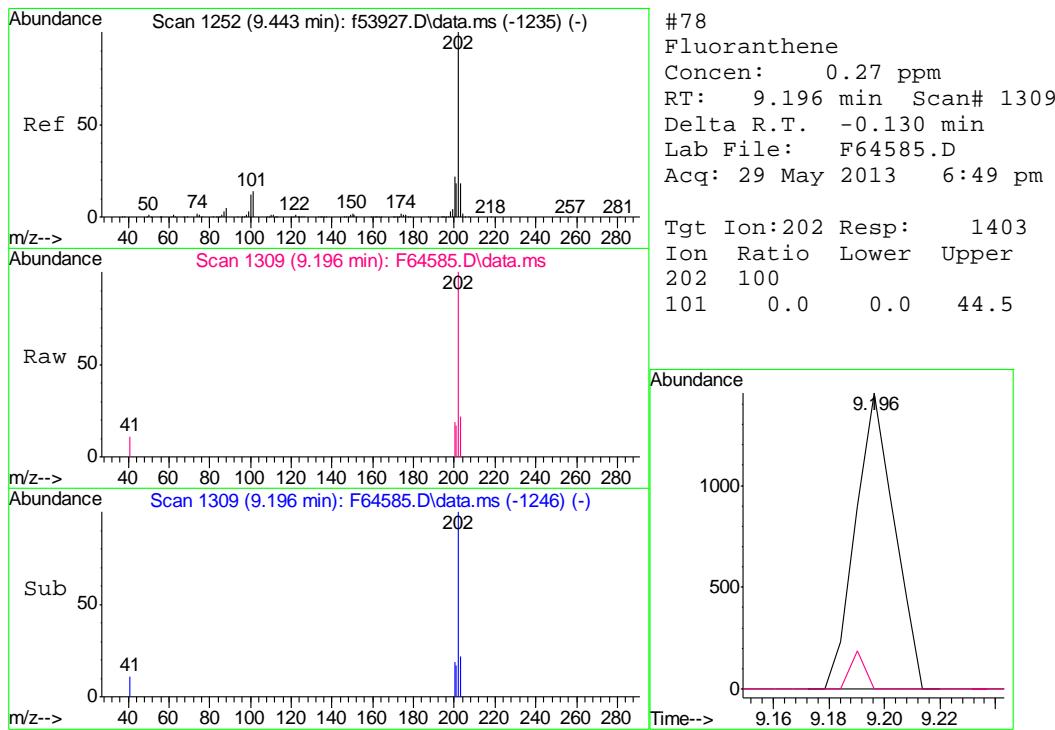
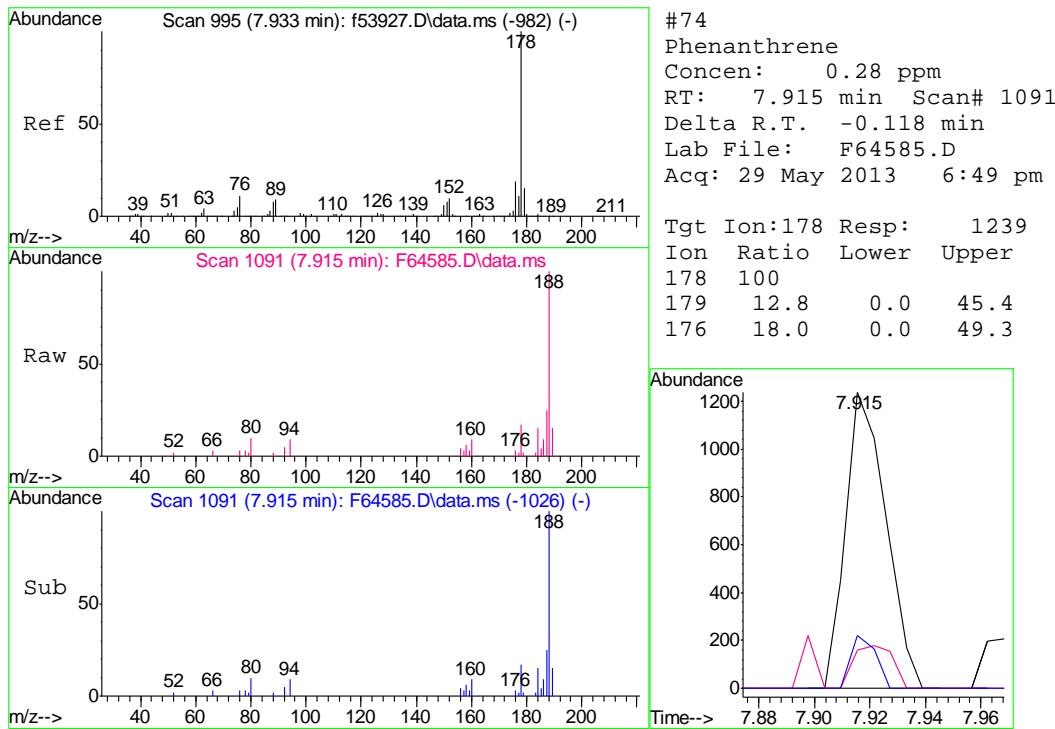
(#) = qualifier out of range (m) = manual integration (+) = signals summed

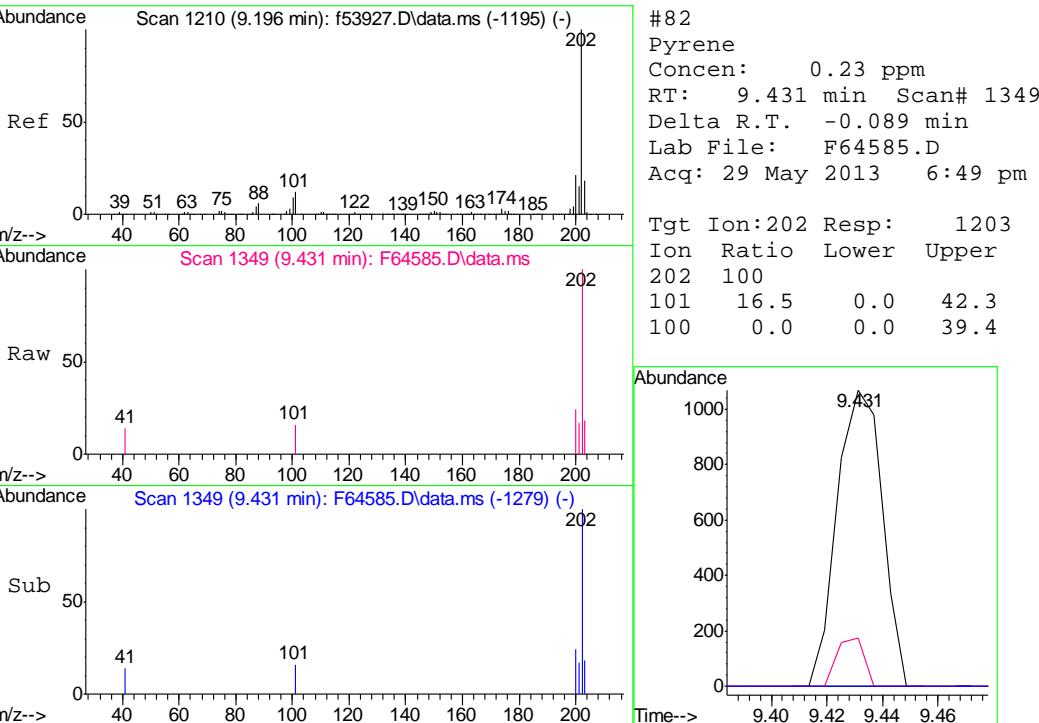
Quantitation Report (QT Reviewed)

Data Path : F:\1\DATA\F130529\
 Data File : F64585.D
 Acq On : 29 May 2013 6:49 pm
 Operator : kristinr
 Sample : JB37147-2
 Misc : OP33326,MSF3005,10.39,,,1,1
 ALS Vial : 25 Sample Multiplier: 1

Quant Time: Jun 11 11:33:38 2013
 Quant Method : F:\1\METHODS\F130408_8270+.E.02.01.m
 Quant Title : SW-864 Method 8270
 QLast Update : Thu May 16 08:36:15 2013
 Response via : Initial Calibration







Quantitation Report (QT Reviewed)

Data Path : F:\1\DATA\F130529\
 Data File : F64586.D
 Acq On : 29 May 2013 7:12 pm
 Operator : kristinr
 Sample : JB37147-3
 Misc : OP33326,MSF3005,20.51,,,1,1
 ALS Vial : 26 Sample Multiplier: 1

Quant Time: Jun 11 11:34:20 2013
 Quant Method : F:\1\METHODS\F130408_8270+.E.02.01.m
 Quant Title : SW-864 Method 8270
 QLast Update : Thu May 16 08:36:15 2013
 Response via : Initial Calibration

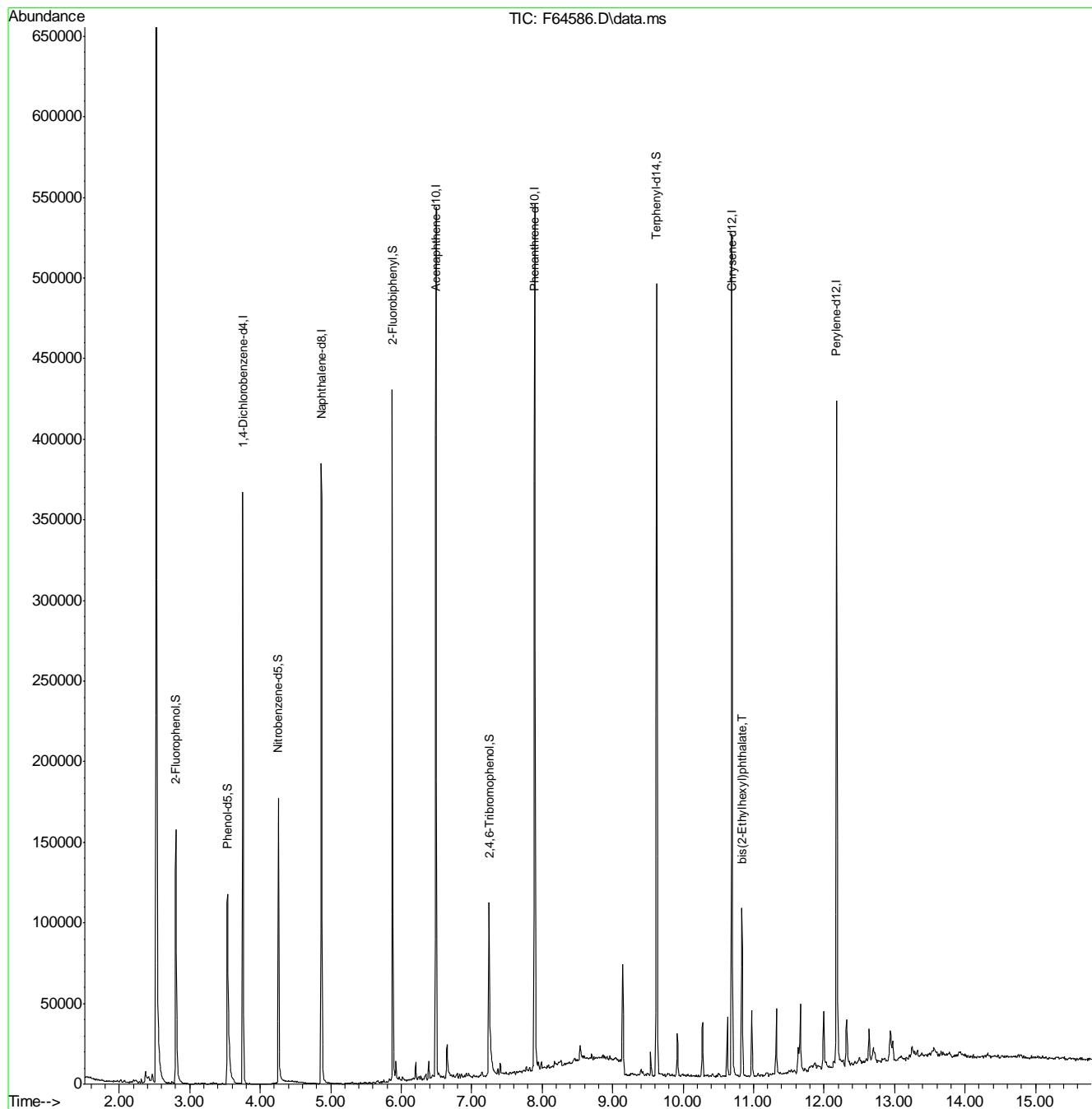
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
<hr/>						
Internal Standards						
1) 1,4-Dichlorobenzene-d4	3.755	152	45400	40.00	ppm	-0.09
24) Naphthalene-d8	4.866	136	168176	40.00	ppm	-0.10
43) Acenaphthene-d10	6.493	164	105408	40.00	ppm	-0.10
66) Phenanthrene-d10	7.897	188	186932	40.00	ppm	-0.11
80) Chrysene-d12	10.693	240	193473	40.00	ppm	-0.11
90) Perylene-d12	12.179	264	168445	40.00	ppm	-0.12
<hr/>						
System Monitoring Compounds						
7) 2-Fluorophenol	2.804	112	46882	35.71	ppm	-0.20
Spiked Amount 100.000	Range 30 - 130		Recovery =	35.71%		
9) Phenol-d5	3.538	99	56886	34.00	ppm	-0.08
Spiked Amount 100.000	Range 30 - 130		Recovery =	34.00%		
25) Nitrobenzene-d5	4.255	82	57727	38.46	ppm	-0.16
Spiked Amount 50.000	Range 30 - 130		Recovery =	76.92%		
48) 2-Fluorobiphenyl	5.876	172	129619	37.00	ppm	-0.14
Spiked Amount 50.000	Range 30 - 130		Recovery =	74.00%		
70) 2,4,6-Tribromophenol	7.245	330	20001	38.53	ppm	-0.10
Spiked Amount 100.000	Range 30 - 130		Recovery =	38.53%		
83) Terphenyl-d14	9.624	244	166806	39.51	ppm	-0.07
Spiked Amount 50.000	Range 30 - 130		Recovery =	79.02%		
<hr/>						
Target Compounds				Qvalue		
89) bis(2-Ethylhexyl)phtha...	10.834	149	31932	12.43	ppm	96

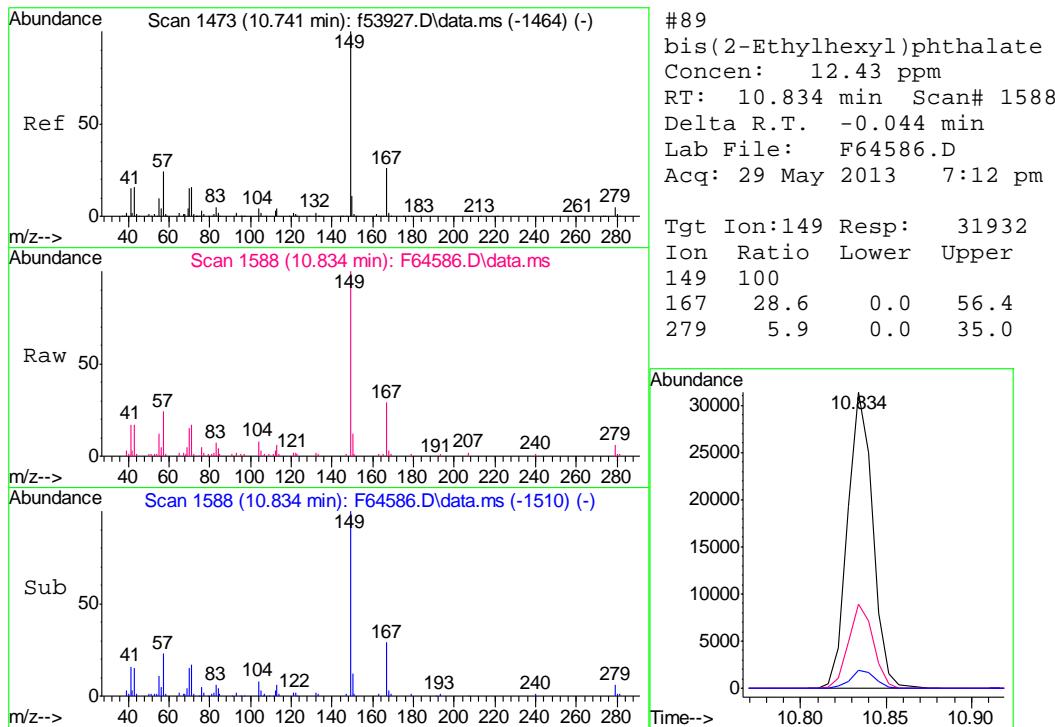
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : F:\1\DATA\F130529\
 Data File : F64586.D
 Acq On : 29 May 2013 7:12 pm
 Operator : kristinr
 Sample : JB37147-3
 Misc : OP33326,MSF3005,20.51,,,1,1
 ALS Vial : 26 Sample Multiplier: 1

Quant Time: Jun 11 11:34:20 2013
 Quant Method : F:\1\METHODS\F130408_8270+.E.02.01.m
 Quant Title : SW-864 Method 8270
 QLast Update : Thu May 16 08:36:15 2013
 Response via : Initial Calibration





Doug Yargeau
 06/11/13 18:59

Data Path : F:\1\DATA\F130529\
 Data File : F64587.D
 Acq On : 29 May 2013 7:34 pm
 Operator : kristinr
 Sample : JB37147-4
 Misc : OP33326,MSF3005,20.13,,,1,1
 ALS Vial : 27 Sample Multiplier: 1

Quant Time: Jun 11 11:36:52 2013
 Quant Method : F:\1\METHODS\F130408_8270+.E.02.01.m
 Quant Title : SW-864 Method 8270
 QLast Update : Thu May 16 08:36:15 2013
 Response via : Initial Calibration

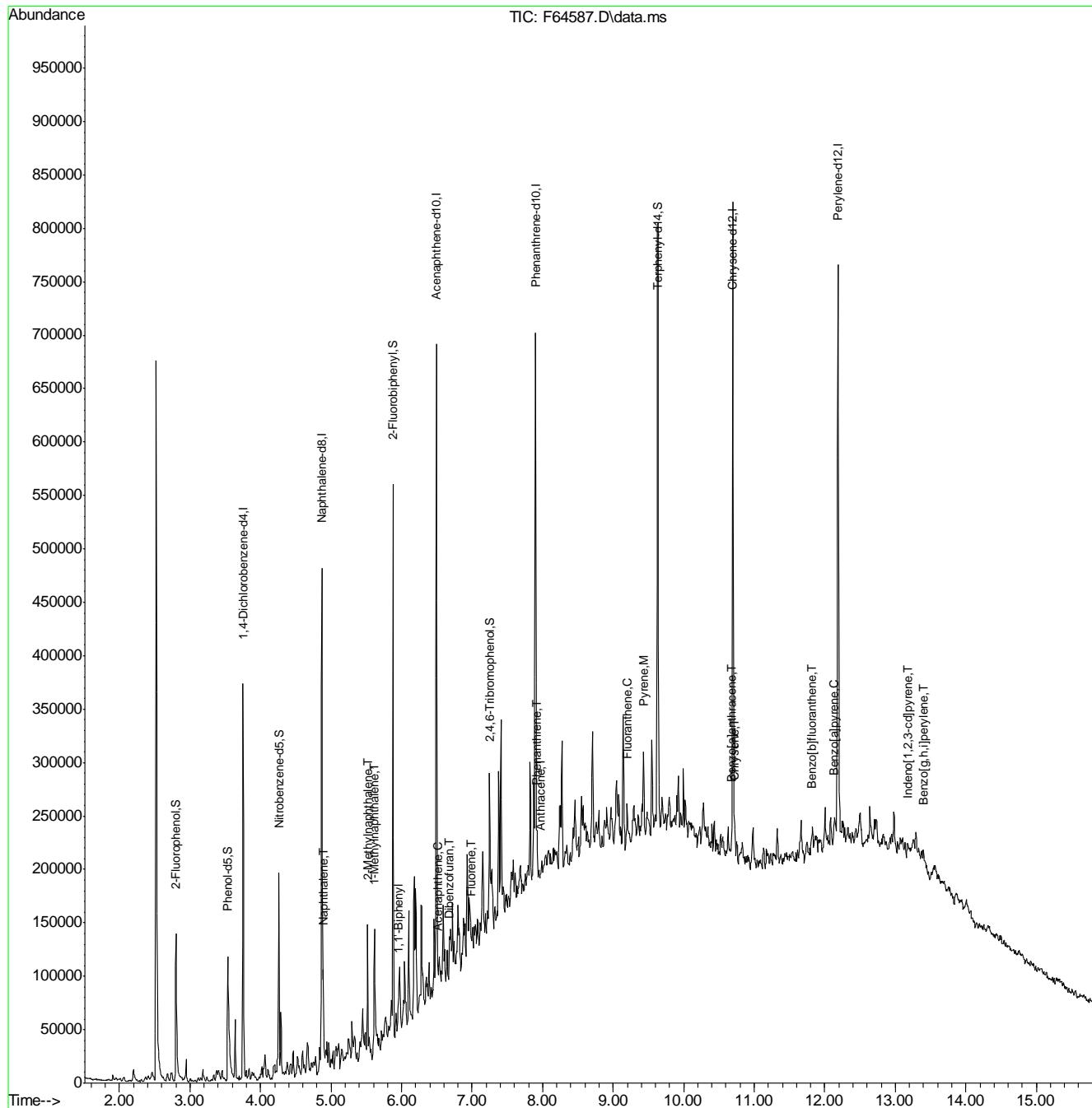
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
<hr/>						
Internal Standards						
1) 1,4-Dichlorobenzene-d4	3.754	152	45680	40.00	ppm	-0.09
24) Naphthalene-d8	4.870	136	172327	40.00	ppm	-0.09
43) Acenaphthene-d10	6.491	164	110803	40.00	ppm	-0.10
66) Phenanthrene-d10	7.901	188	189401	40.00	ppm	-0.10
80) Chrysene-d12	10.697	240	217322	40.00	ppm	-0.10
90) Perylene-d12	12.190	264	209949	40.00	ppm	-0.11
<hr/>						
System Monitoring Compounds						
7) 2-Fluorophenol	2.802	112	42893	32.47	ppm	-0.21
Spiked Amount 100.000	Range 30 - 130		Recovery =	32.47%		
9) Phenol-d5	3.537	99	53334	31.68	ppm	-0.09
Spiked Amount 100.000	Range 30 - 130		Recovery =	31.68%		
25) Nitrobenzene-d5	4.259	82	53649	34.88	ppm	-0.16
Spiked Amount 50.000	Range 30 - 130		Recovery =	69.76%		
48) 2-Fluorobiphenyl	5.880	172	130011	35.31	ppm	-0.14
Spiked Amount 50.000	Range 30 - 130		Recovery =	70.62%		
70) 2,4,6-Tribromophenol	7.249	330	22209	42.22	ppm	-0.09
Spiked Amount 100.000	Range 30 - 130		Recovery =	42.22%		
83) Terphenyl-d14	9.634	244	188593	39.77	ppm	-0.06
Spiked Amount 50.000	Range 30 - 130		Recovery =	79.54%		
<hr/>						
Target Compounds						
				Qvalue		
34) Naphthalene	4.888	128	8117	1.89	ppm	87
39) 2-Methylnaphthalene	5.516	142	28437	9.56	ppm	96
40) 1-Methylnaphthalene	5.616	142	21626m	7.54	ppm	
53) Acenaphthene	6.521	153	2109m	0.69	ppm	
55) Dibenzofuran	6.673	168	1645	0.37	ppm	85
59) Fluorene	6.991	166	3482m	1.00	ppm	
65) 1,1'-Biphenyl	5.957	154	4139	1.15	ug/mL#	100
74) Phenanthrene	7.919	178	15350	3.15	ppm	100
75) Anthracene	7.966	178	4993	0.99	ppm	86
78) Fluoranthene	9.199	202	6622	1.17	ppm	89
82) Pyrene	9.434	202	24142	3.89	ppm	96
87) Benzo[a]anthracene	10.680	228	5516	1.00	ppm	74
88) Chrysene	10.721	228	7017	1.28	ppm	64
92) Benzo[b]fluoranthene	11.819	252	4954m	0.79	ppm	
94) Benzo[a]pyrene	12.137	252	3826	0.67	ppm	88
95) Indeno[1,2,3-cd]pyrene	13.176	276	3412	0.51	ppm	93
97) Benzo[g,h,i]perylene	13.400	276	5810	1.05	ppm	90
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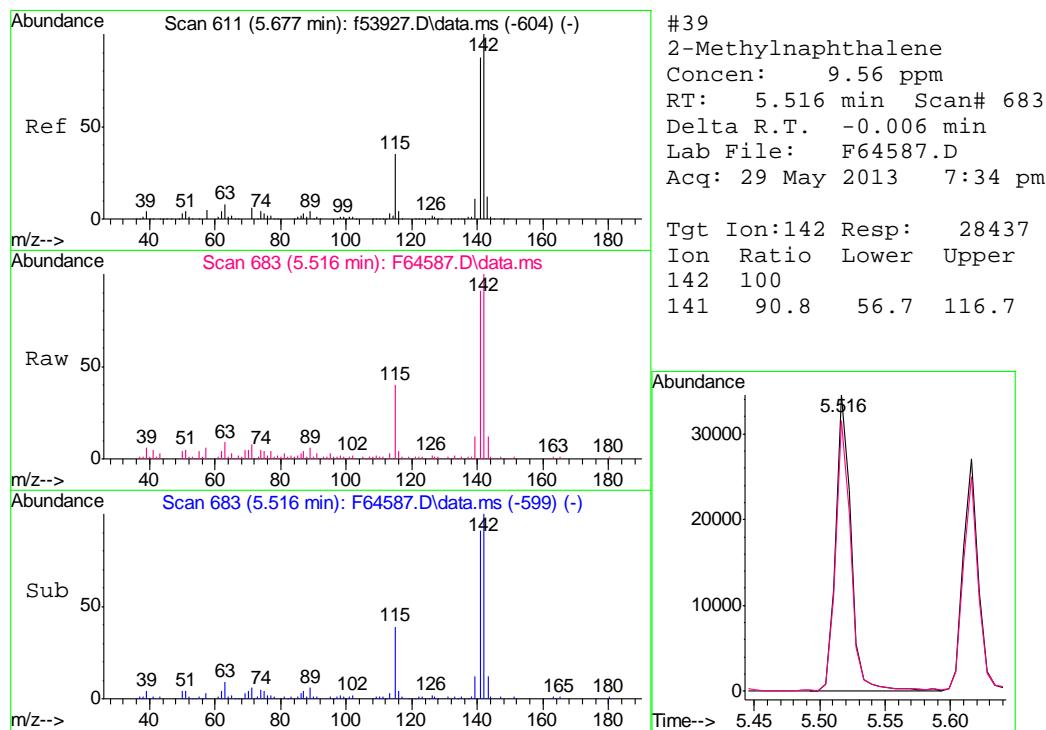
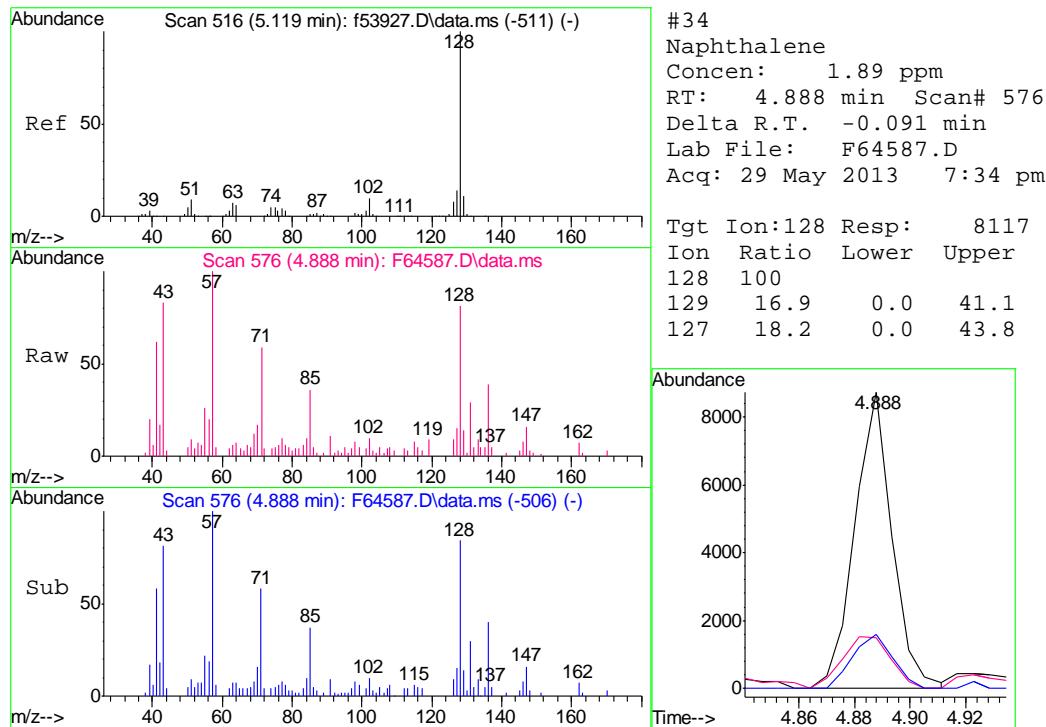
(#) = qualifier out of range (m) = manual integration (+) = signals summed

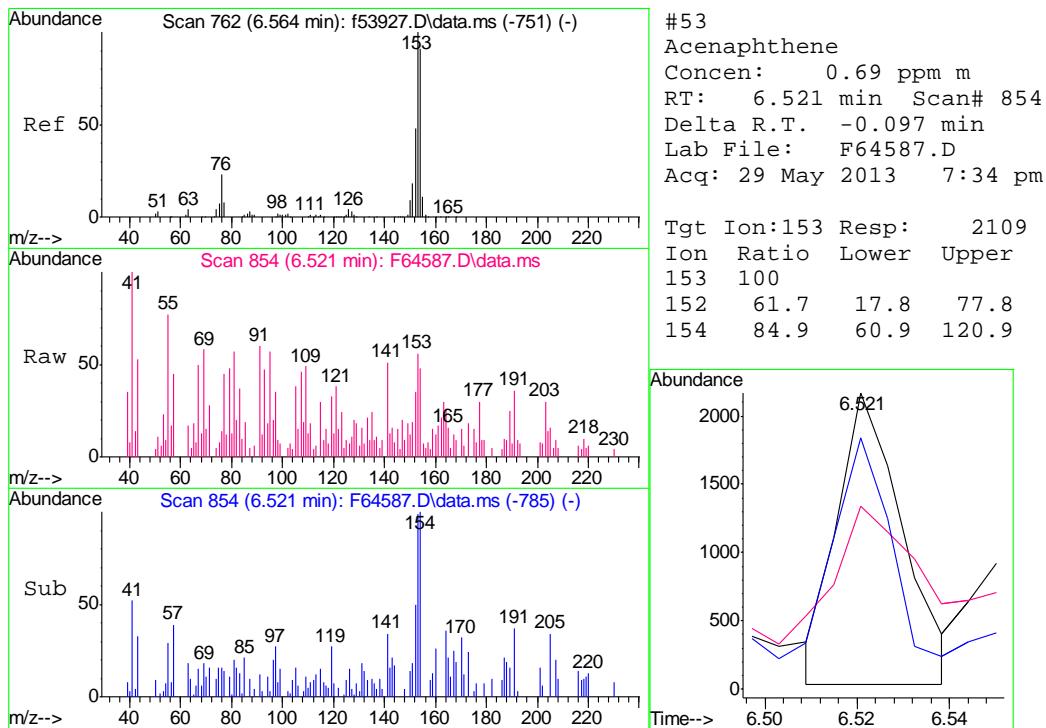
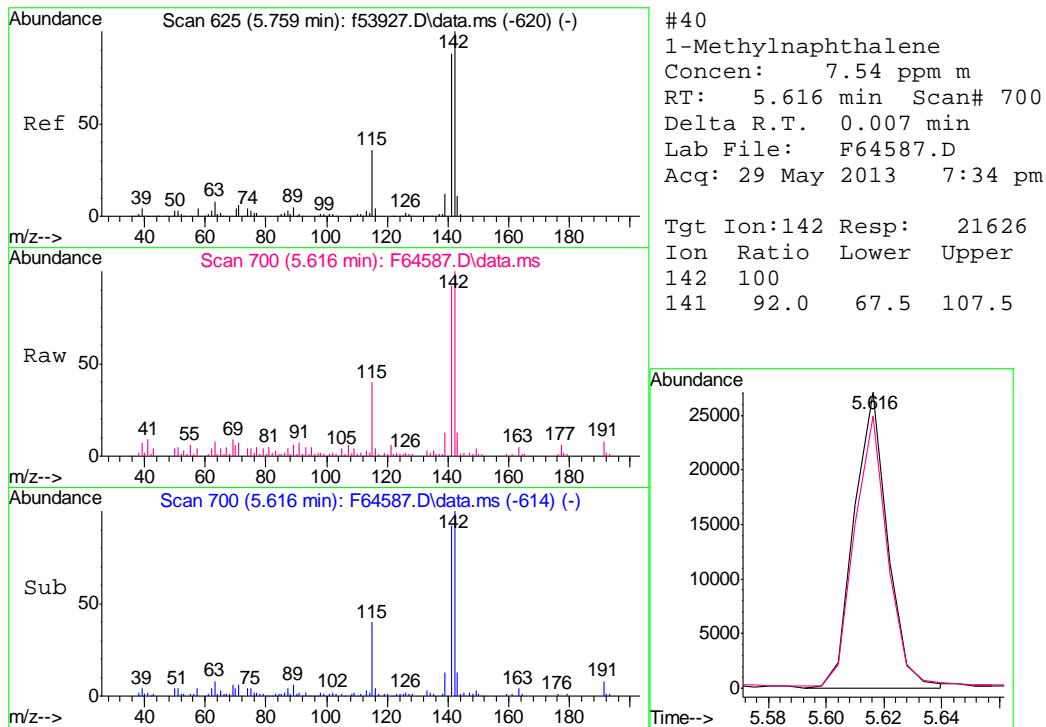
Quantitation Report (QT Reviewed)

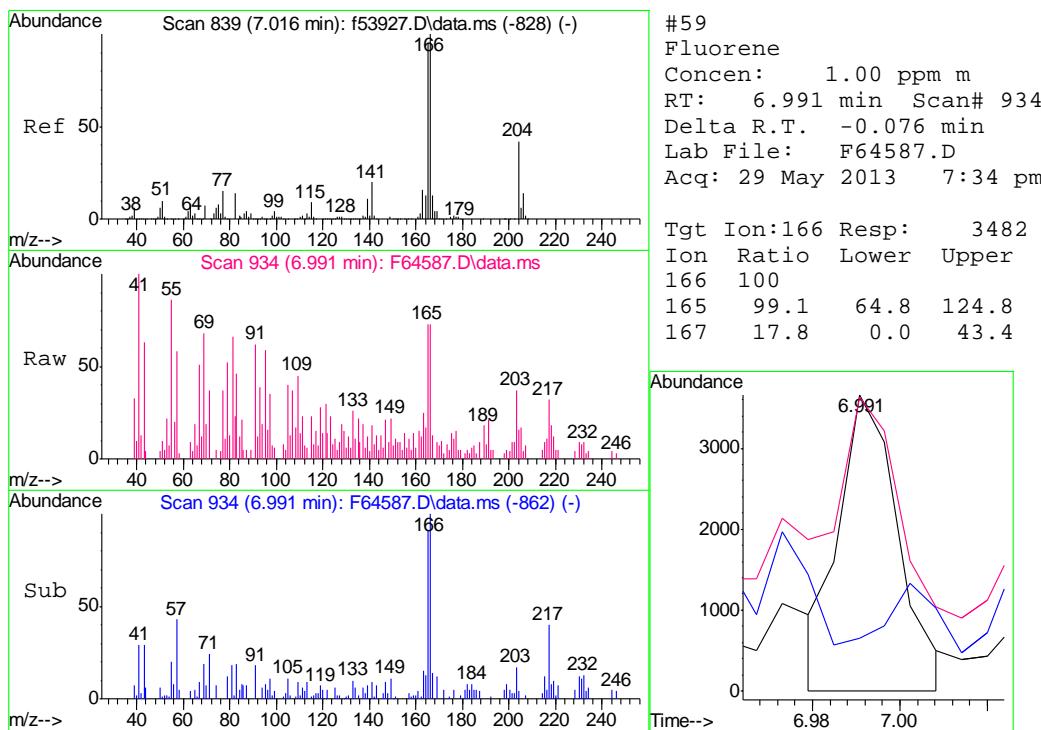
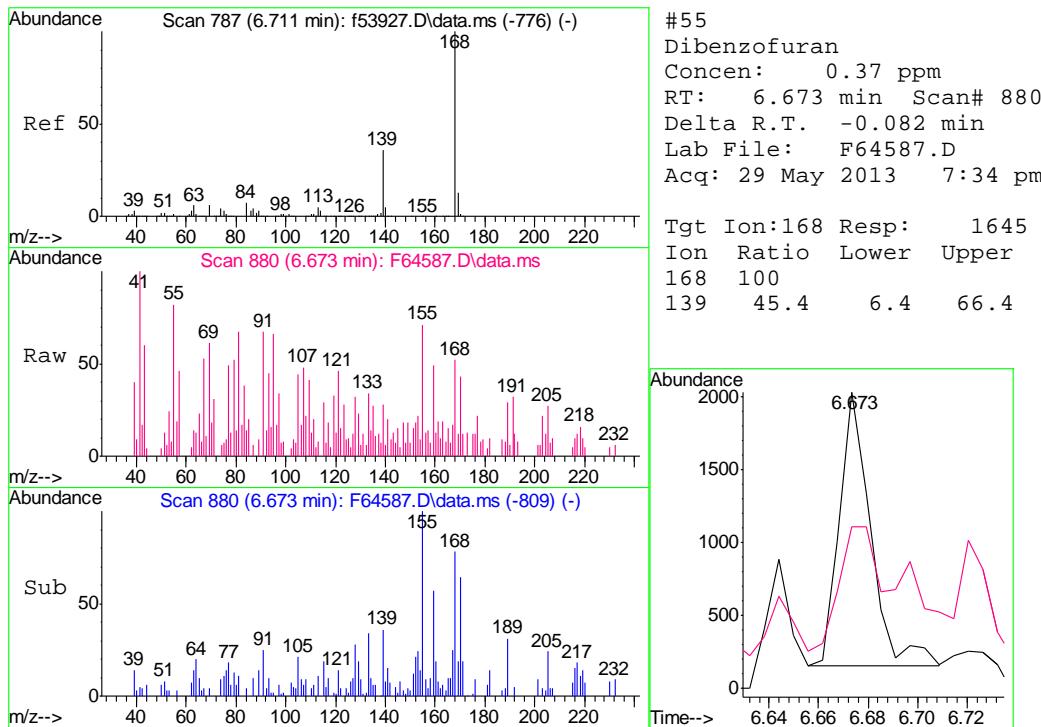
Data Path : F:\1\DATA\F130529\
 Data File : F64587.D
 Acq On : 29 May 2013 7:34 pm
 Operator : kristinr
 Sample : JB37147-4
 Misc : OP33326,MSF3005,20.13,,,1,1
 ALS Vial : 27 Sample Multiplier: 1

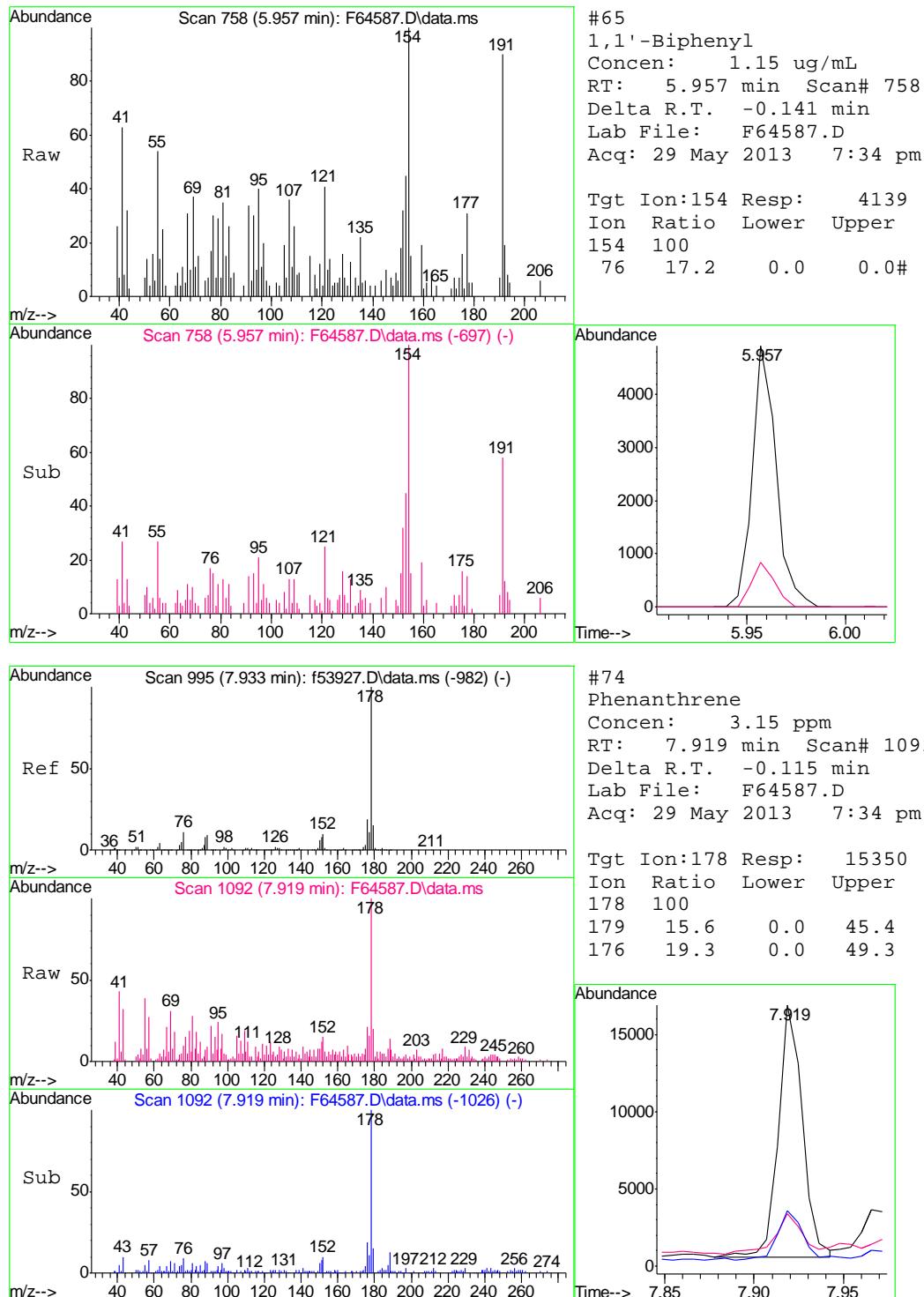
Quant Time: Jun 11 11:36:52 2013
 Quant Method : F:\1\METHODS\F130408_8270+.E.02.01.m
 Quant Title : SW-864 Method 8270
 QLast Update : Thu May 16 08:36:15 2013
 Response via : Initial Calibration

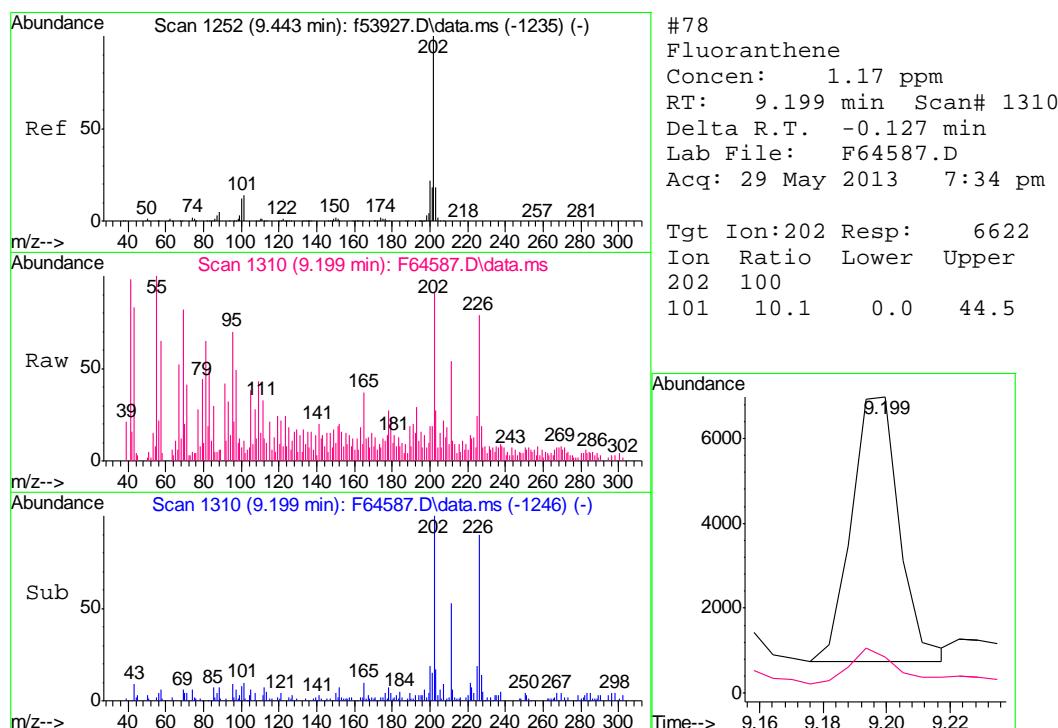
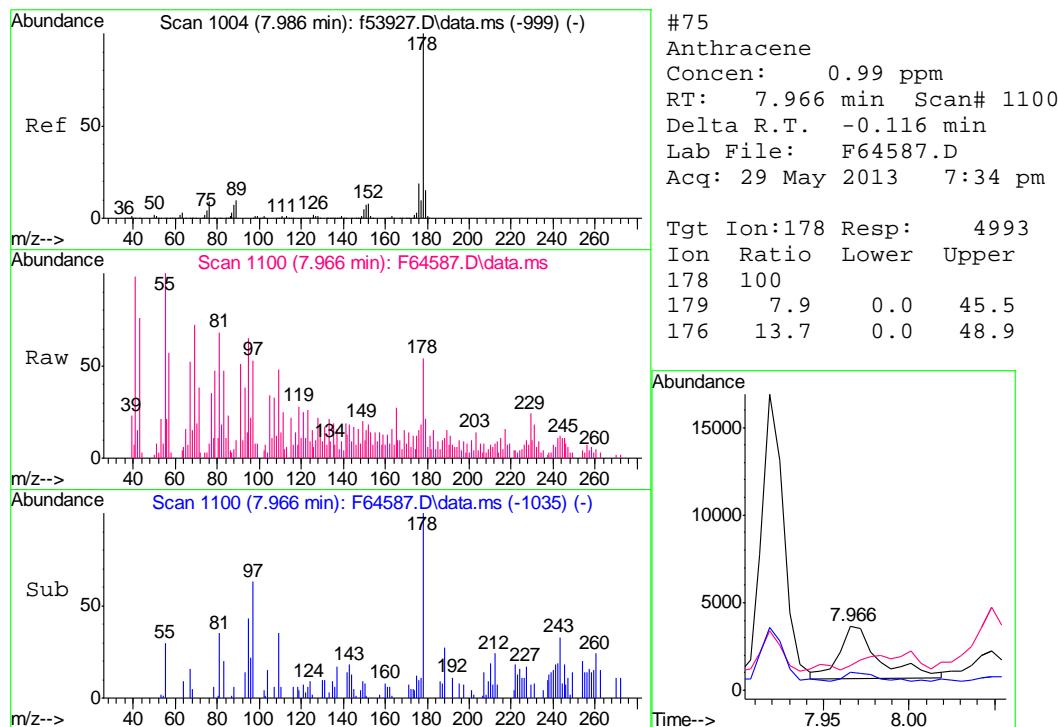


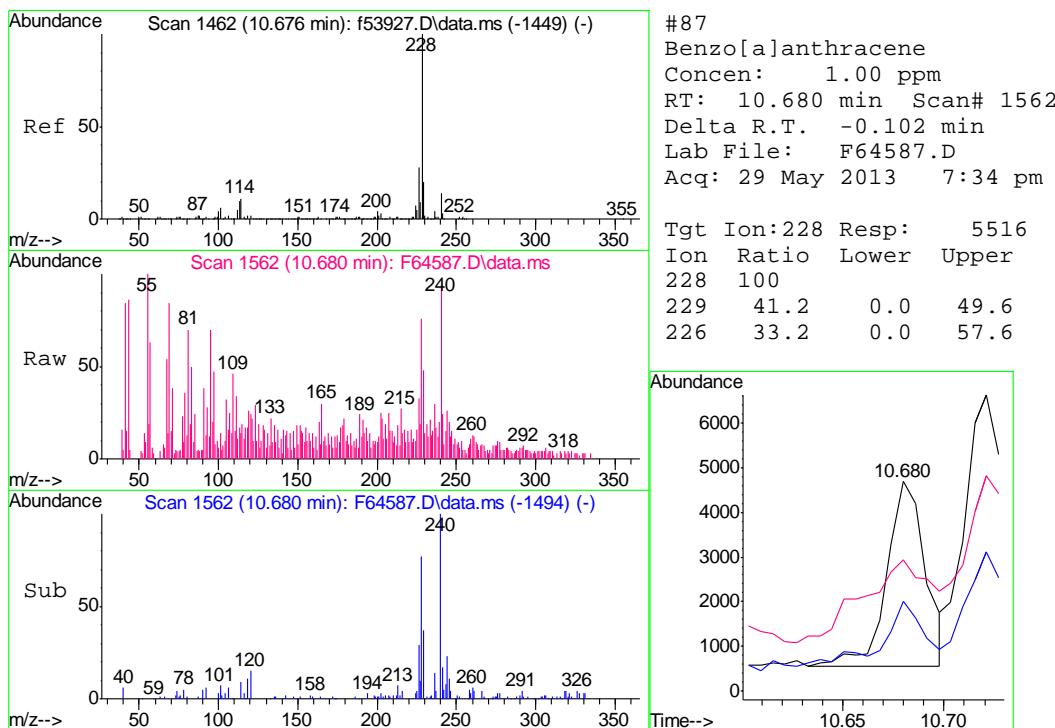
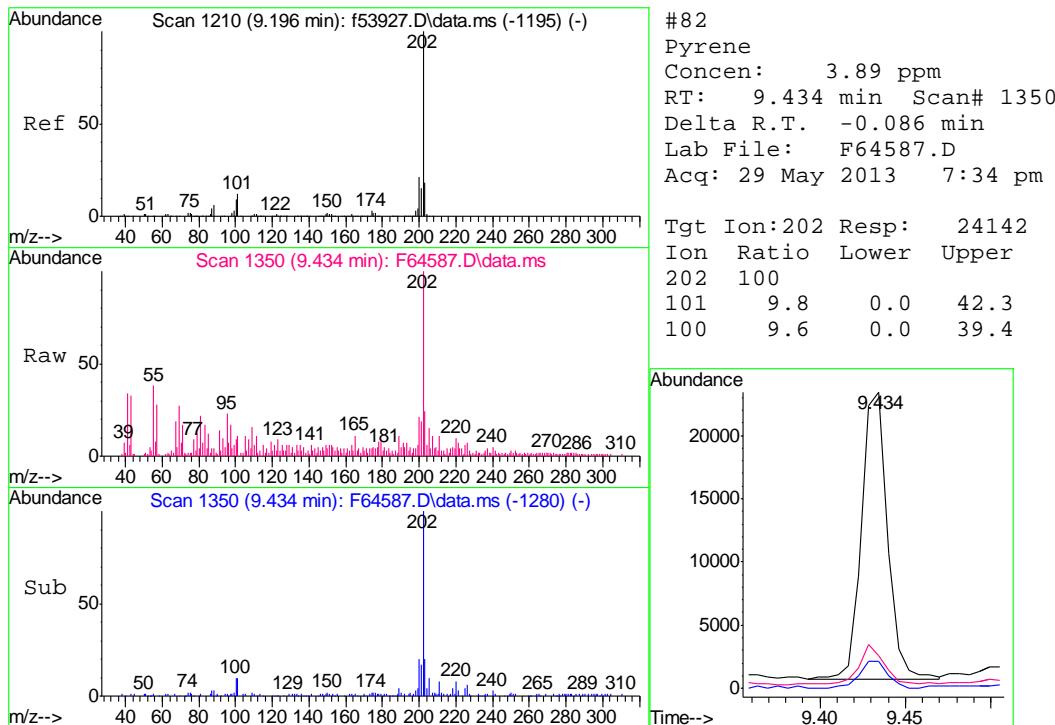


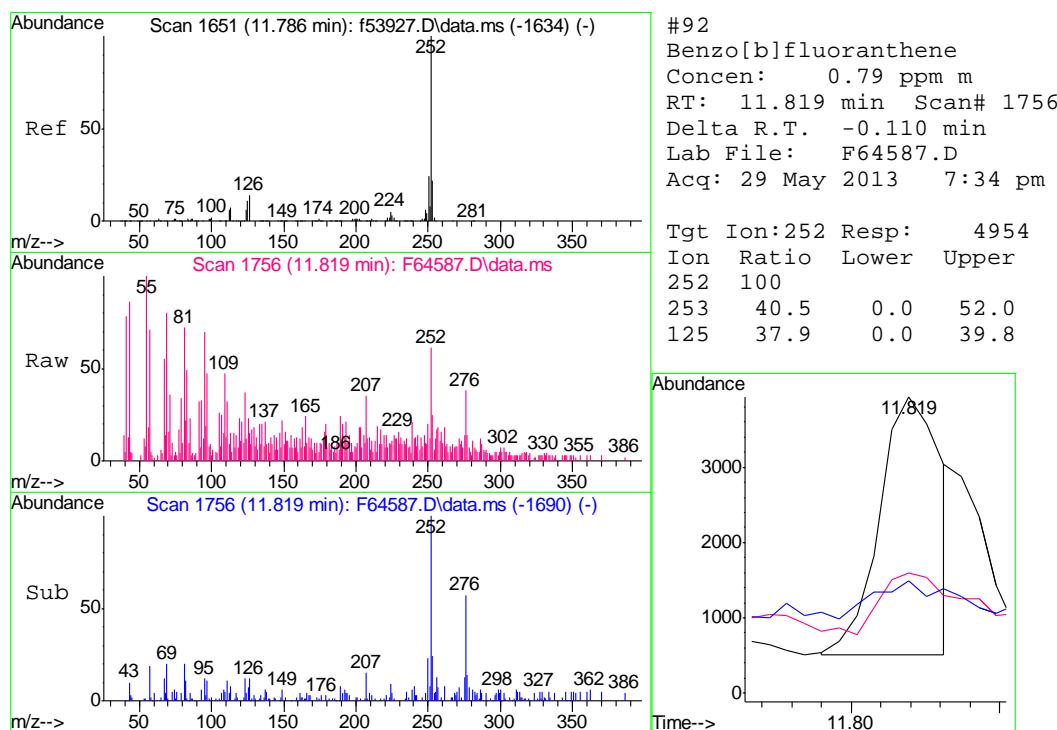
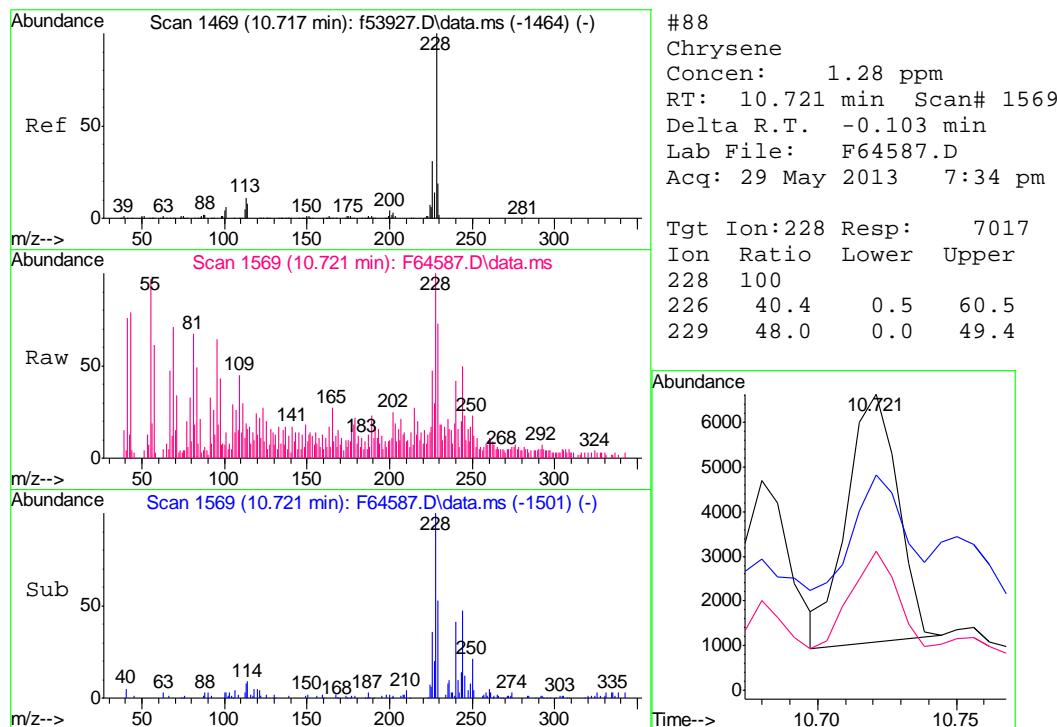


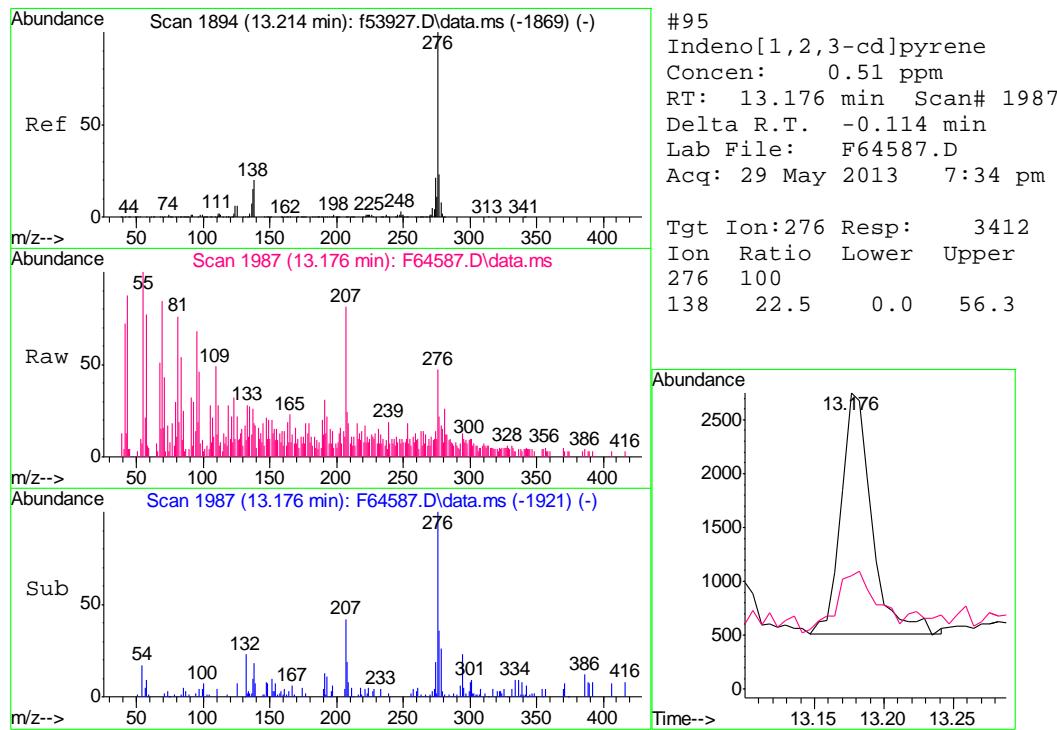
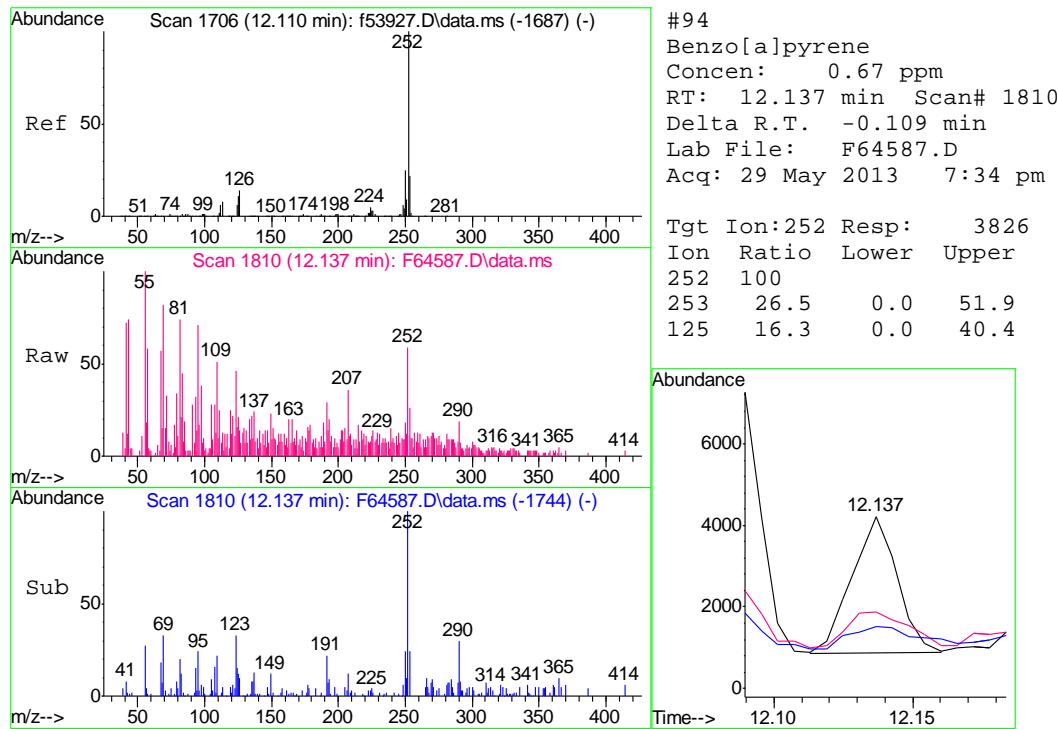


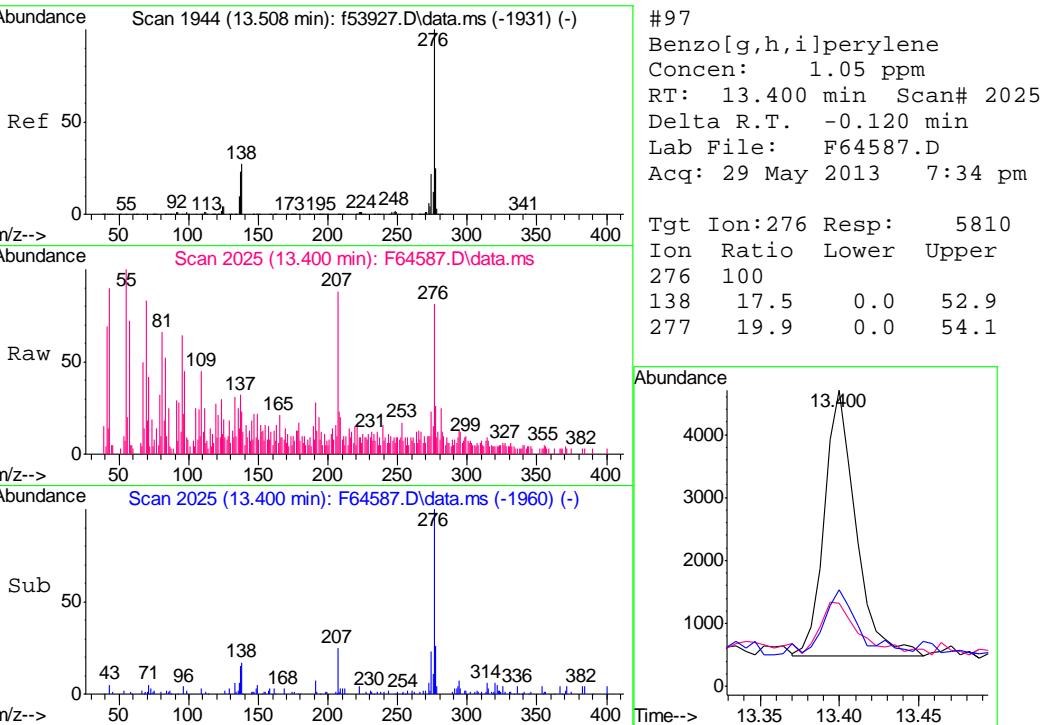












Quantitation Report (QT Reviewed)

Data Path : F:\1\DATA\F130529\
 Data File : F64579.D
 Acq On : 29 May 2013 4:31 pm
 Operator : kristinr
 Sample : OP33326-MB
 Misc : OP33326,MSF3012,20.16,,,1,1
 ALS Vial : 19 Sample Multiplier: 1

Quant Time: Jun 06 17:07:58 2013
 Quant Method : F:\1\METHODS\F130408_8270+.E.02.01.m
 Quant Title : SW-864 Method 8270
 QLast Update : Thu May 16 08:36:15 2013
 Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
<hr/>						
Internal Standards						
1) 1,4-Dichlorobenzene-d4	3.755	152	40733	40.00	ppm	-0.09
24) Naphthalene-d8	4.871	136	153984	40.00	ppm	-0.09
43) Acenaphthene-d10	6.492	164	100225	40.00	ppm	-0.10
66) Phenanthrene-d10	7.896	188	183296	40.00	ppm	-0.11
80) Chrysene-d12	10.692	240	194816	40.00	ppm	-0.11
90) Perylene-d12	12.179	264	179912	40.00	ppm	-0.12
<hr/>						
System Monitoring Compounds						
7) 2-Fluorophenol	2.803	112	49354	41.90	ppm	-0.20
Spiked Amount 100.000	Range 30 - 130		Recovery =	41.90%		
9) Phenol-d5	3.531	99	61638	41.06	ppm	-0.09
Spiked Amount 100.000	Range 30 - 130		Recovery =	41.06%		
25) Nitrobenzene-d5	4.260	82	62038	45.14	ppm	-0.16
Spiked Amount 50.000	Range 30 - 130		Recovery =	90.28%		
48) 2-Fluorobiphenyl	5.881	172	135284	40.61	ppm	-0.14
Spiked Amount 50.000	Range 30 - 130		Recovery =	81.22%		
70) 2,4,6-Tribromophenol	7.244	330	20901	41.06	ppm	-0.10
Spiked Amount 100.000	Range 30 - 130		Recovery =	41.06%		
83) Terphenyl-d14	9.629	244	192815	45.36	ppm	-0.06
Spiked Amount 50.000	Range 30 - 130		Recovery =	90.72%		

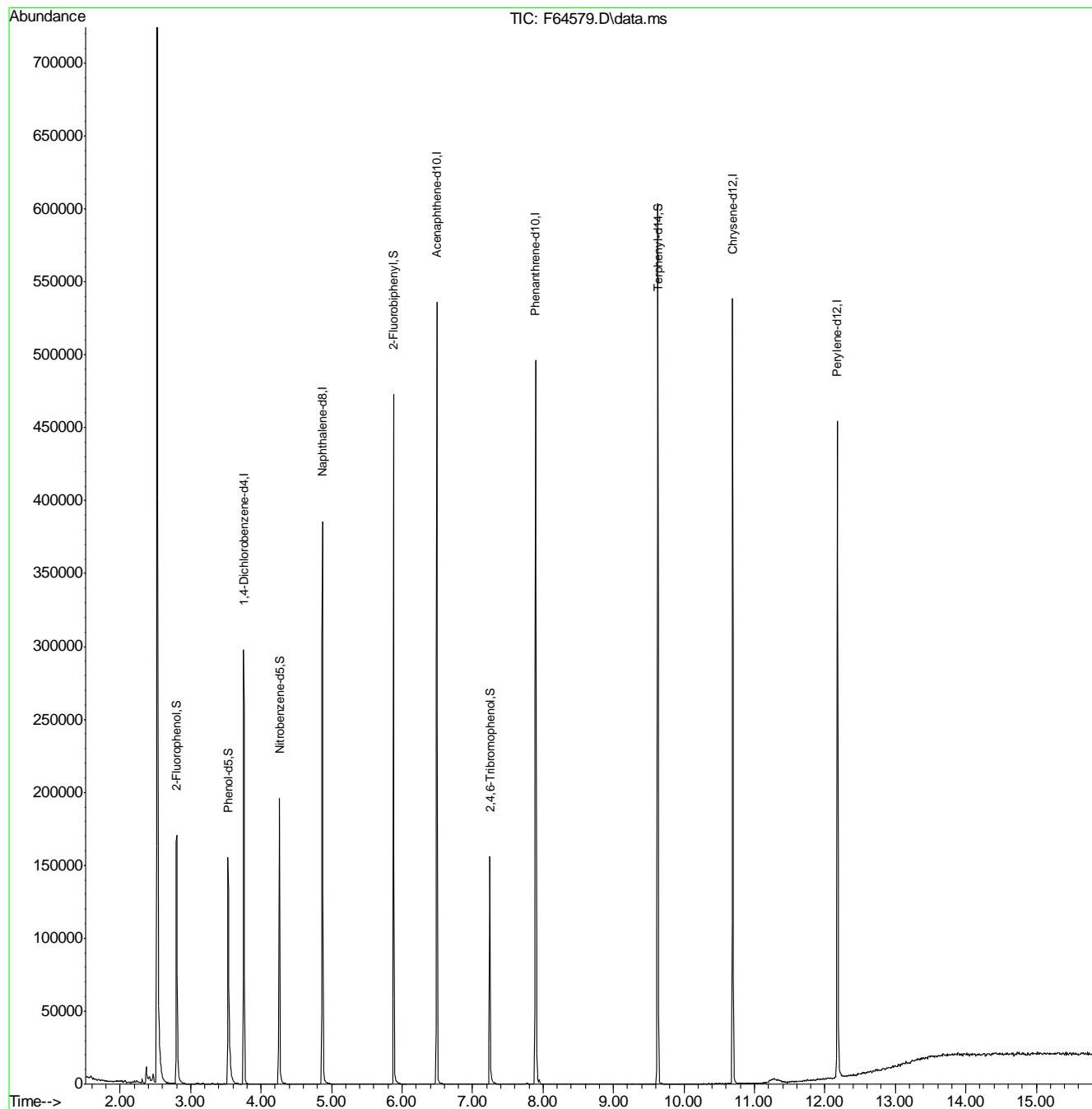
Target Compounds	Qvalue
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(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : F:\1\DATA\F130529\
 Data File : F64579.D
 Acq On : 29 May 2013 4:31 pm
 Operator : kristinr
 Sample : OP33326-MB
 Misc : OP33326,MSF3012,20.16,,,1,1
 ALS Vial : 19 Sample Multiplier: 1

Quant Time: Jun 06 17:07:58 2013
 Quant Method : F:\1\METHODS\F130408_8270+.E.02.01.m
 Quant Title : SW-864 Method 8270
 QLast Update : Thu May 16 08:36:15 2013
 Response via : Initial Calibration





GC Volatiles

QC Data Summaries

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Surrogate Recovery Summaries
- GC Surrogate Retention Time Summaries
- Initial and Continuing Calibration Summaries

Method Blank Summary

Job Number: JB37147

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP33301-MB	BK25114.D	1	05/24/13	AP	05/23/13	OP33301	GBK874

The QC reported here applies to the following samples:

Method: SW846 8011

JB37147-1, JB37147-2, JB37147-3, JB37147-4

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	2.5	0.95	ug/kg	

CAS No.	Surrogate Recoveries	Limits	
460-00-4	Bromofluorobenzene (S)	125%	61-167%
460-00-4	Bromofluorobenzene (S)	134%	61-167%

Blank Spike Summary

Page 1 of 1

Job Number: JB37147

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP33301-BS	BK25115.D	1	05/24/13	AP	05/23/13	OP33301	GBK874

The QC reported here applies to the following samples:

Method: SW846 8011

JB37147-1, JB37147-2, JB37147-3, JB37147-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
106-93-4	1,2-Dibromoethane	32.5	38.5	118	56-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	124%	61-167%
460-00-4	Bromofluorobenzene (S)	137%	61-167%

11.2.1
11

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JB37147

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP33301-MS	BK25121.D	1	05/24/13	AP	05/23/13	OP33301	GBK874
OP33301-MSD	BK25122.D	1	05/24/13	AP	05/23/13	OP33301	GBK874
JB36591-1	BK25116.D	1	05/24/13	AP	05/23/13	OP33301	GBK874

The QC reported here applies to the following samples:

Method: SW846 8011

JB37147-1, JB37147-2, JB37147-3, JB37147-4

CAS No.	Compound	JB36591-1		Spike	MS	MS	MSD	MSD	RPD	Limits Rec/RPD
		ug/kg	Q	ug/kg	ug/kg	%	ug/kg	%		
106-93-4	1,2-Dibromoethane	ND		34.6	47.4	137	48.5	138	2	48-141/27
CAS No.	Surrogate Recoveries		MS	MSD		JB36591-1	Limits			
460-00-4	Bromofluorobenzene (S)		139%	141%		135%	61-167%			
460-00-4	Bromofluorobenzene (S)		142%	145%		144%	61-167%			

* = Outside of Control Limits.

11.3.1
11

Volatile Surrogate Recovery Summary

Page 1 of 1

Job Number: JB37147

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Method: SW846 8011

Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 ^a	S1 ^b
JB37147-1	BK25128.D	126.0	143.0
JB37147-2	BK25129.D	122.0	136.0
JB37147-3	BK25130.D	128.0	154.0
JB37147-4	BK25131.D	118.0	149.0
OP33301-BS	BK25115.D	124.0	137.0
OP33301-MB	BK25114.D	125.0	134.0
OP33301-MS	BK25121.D	139.0	142.0
OP33301-MSD	BK25122.D	141.0	145.0

Surrogate
Compounds

Recovery
Limits

S1 = Bromofluorobenzene (S)

61-167%

- (a) Recovery from GC signal #2
- (b) Recovery from GC signal #1

11.4.1

11

GC Surrogate Retention Time Summary

Page 1 of 1

Job Number: JB37147

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	GBK874-ICC874	Injection Date:	05/24/13
Lab File ID:	BK25108.D	Injection Time:	09:01
Instrument ID:	GCBK	Method:	SW846 8011

S1 ^a
RT S1 ^b
RT

Check Std	4.21	4.54
-----------	------	------

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT	S1 ^b RT
OP33301-MB	BK25114.D	05/24/13	11:20	4.21	4.54
OP33301-BS	BK25115.D	05/24/13	11:42	4.21	4.54
JB36591-1	BK25116.D	05/24/13	12:05	4.21	4.54
ZZZZZZ	BK25117.D	05/24/13	12:27	4.21	4.54
ZZZZZZ	BK25118.D	05/24/13	12:50	4.21	4.54
ZZZZZZ	BK25119.D	05/24/13	13:12	4.21	4.54
ZZZZZZ	BK25120.D	05/24/13	13:35	4.21	4.54
OP33301-MS	BK25121.D	05/24/13	13:57	4.21	4.54
OP33301-MSD	BK25122.D	05/24/13	14:20	4.21	4.54
ZZZZZZ	BK25123.D	05/24/13	14:42	4.21	4.54

Surrogate
Compounds

S1 = Bromofluorobenzene (S)

- (a) Retention time from GC signal #2
- (b) Retention time from GC signal #1

11.5.1
11

GC Surrogate Retention Time Summary

Page 1 of 1

Job Number: JB37147

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	GBK874-CC874	Injection Date:	05/24/13
Lab File ID:	BK25124.D	Injection Time:	15:05
Instrument ID:	GCBK	Method:	SW846 8011

S1 ^a
RT S1 ^b
RT

Check Std	4.21	4.54
-----------	------	------

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT	S1 ^b RT
ZZZZZZ	BK25125.D	05/24/13	15:27	4.21	4.54
ZZZZZZ	BK25126.D	05/24/13	15:51	4.21	4.54
ZZZZZZ	BK25127.D	05/24/13	16:14	4.21	4.54
JB37147-1	BK25128.D	05/24/13	16:37	4.21	4.54
JB37147-2	BK25129.D	05/24/13	17:01	4.21	4.54
JB37147-3	BK25130.D	05/24/13	17:25	4.21	4.54
JB37147-4	BK25131.D	05/24/13	17:48	4.21	4.54
ZZZZZZ	BK25132.D	05/24/13	18:12	4.21	4.54
ZZZZZZ	BK25133.D	05/24/13	18:36	4.21	4.54
ZZZZZZ	BK25134.D	05/24/13	19:00	4.21	4.54

Surrogate
Compounds

S1 = Bromofluorobenzene (S)

- (a) Retention time from GC signal #2
- (b) Retention time from GC signal #1

11.5.2
11

Initial Calibration Summary

Job Number: JB37147

Sample: GBK874-ICC874

Account: ALNJ Accutest New Jersey

Lab FileID: BK25108.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Response Factor Report GCBK

Method : C:\msdchem\1\METHODS\EDS130524.M (ChemStation Integrator)

Title : EDB /Rtx35/DB1701

Last Update : Tue May 28 07:48:27 2013

Response via : Initial Calibration

Calibration Files

1	=BK25107.d	2	=BK25108.d	3	=BK25109.d	4	=BK25110.d
5	=BK25111.d	6	=BK25112.d				

	Compound	1	2	3	4	5	6	Avg	%RSD
<hr/>									
1)	1,2-Dibromoethane	2.499	2.604	2.777	3.003	3.058	2.018	2.660	E8 14.37
	----- Quadratic regression -----							Coefficient =	0.9978
	Response Ratio =	-35331077.80275	+ 288550645.50937	*A	+ -787897.99152	*A^2			
2) s	4-Bromofluorobenzen	1.272	1.306	1.296	1.225	1.300	1.095	1.249	E7 6.50
3)	1,2-Dibromo-3-chlor	5.300	5.204	5.221	5.116	4.745	4.700	5.048	E8 5.13

Signal #2

1)	1,2-Dibromoethane	2.943	3.056	3.003	2.879	2.438	2.442	2.793	E6 10.03
	----- Quadratic regression -----							Coefficient =	0.9997
	Response Ratio =	-930532.70507	+ 3131764.13817	*A	+ -3297.78156	*A^2			
<hr/>									
2) s	4-Bromofluorobenzen	1.842	1.989	2.138	2.163	2.054	1.985	2.029	E5 5.79
3)	1,2-Dibromo-3-chlor	5.735	5.685	5.571	5.440	5.341	5.094	5.478	E6 4.36

(#)= Out of Range

EDS130524.M Tue May 28 07:52:13 2013

11.6.1

11

Initial Calibration Verification

Job Number: JB37147

Sample: GBK874-ICV874

Account: ALNJ Accutest New Jersey

Lab FileID: BK25113.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Signal #1 : C:\msdchem\1\DATA\BK...24\BK25113.d\ECD1A.ch Vial: 57
 Signal #2 : C:\msdchem\1\DATA\BK130524\BK25113.d\ECD2B.ch
 Acq On : 24 May 2013 10:57 am Operator: andrip
 Sample : icv874-20,edb-icv Inst : GCBK
 Misc : op33301,gbk874,30,,,50,,s Multiplr: 1.00
 IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\msdchem\1\METHODS\EDS130524.M (ChemStation Integrator)
 Title : EDB /Rtx35/DB1701
 Last Update : Tue May 28 07:48:27 2013
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 85% Max. R.T. Dev 0.50min
 Max. RRF Dev : 15% Max. Rel. Area : 115%

Compound	AvgRF	CCRF	% Dev	Area	% Dev(min)	RT	Window
1, 2-Dibromoethane	20.000	19.092	4.5	100	0.00	3.30-	3.36
4-Bromofluorobenzene	12.491	12.329 E6	1.3	94	0.00	4.51-	4.57
1, 2-Dibromo-3-chloropr	504.765	512.687 E6	-1.6	99	0.00	5.93-	5.99

***** Signal #2 *****

Compound	AvgRF	CCRF	% Dev	Area	% Dev(min)	RT	Window
1, 2-Dibromoethane	20.000	20.719	-3.6	102	0.00	3.14-	3.20
4-Bromofluorobenzene	202.862	205.700 E3	-1.4	103	0.00	4.18-	4.24
1, 2-Dibromo-3-chloropr	5.478	5.797 E6	-5.8	102	0.00	5.84-	5.90

(#) = Out of Range SPCC's out = 0 CCC's out = 0
 BK25108.d EDS130524.M Tue May 28 07:51:22 2013

Continuing Calibration Summary

Job Number: JB37147

Sample: GBK874-CC874

Account: ALNJ Accutest New Jersey

Lab FileID: BK25124.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Signal #1 : C:\msdchem\1\DATA\BK...24\BK25124.d\ECD1A.ch Vial: 100
 Signal #2 : C:\msdchem\1\DATA\BK130524\BK25124.d\ECD2B.ch
 Acq On : 24 May 2013 3:05 pm Operator: andrip
 Sample : cc874-20,edb-2 Inst : GCBK
 Misc : op33301,gbk874,30,,,50,,,s Multiplr: 1.00
 IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\msdchem\1\METHODS\EDS130524.M (ChemStation Integrator)
 Title : EDB /Rtx35/DB1701
 Last Update : Tue May 28 07:48:27 2013
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 85% Max. R.T. Dev 0.50min
 Max. RRF Dev : 15% Max. Rel. Area : 115%

Compound	AvgRF	CCRF	% Dev	Area	% Dev(min)	RT	Window
----- True Calc. % Drift -----							
1 1,2-Dibromoethane	20.000	14.599	27.0#	77	0.00	3.29-	3.35
----- AvgRF CCRF % Dev -----							
2 s 4-Bromofluorobenzene	12.491	10.439 E6	16.4#	80#	0.00	4.51-	4.57
3 1,2-Dibromo-3-chloropr	504.765	385.193 E6	23.7#	74#	0.00	5.92-	5.98
***** Signal #2 *****							

Compound	AvgRF	CCRF	% Dev	Area	% Dev(min)	RT	Window
----- True Calc. % Drift -----							
1 1,2-Dibromoethane	20.000	18.501	7.5	91	0.00	3.13-	3.19
----- AvgRF CCRF % Dev -----							
2 s 4-Bromofluorobenzene	202.862	186.156 E3	8.2	94	0.00	4.18-	4.24
3 1,2-Dibromo-3-chloropr	5.478	5.218 E6	4.7	92	0.00	5.84-	5.90

(#) = Out of Range SPCC's out = 0 CCC's out = 0
 BK25108.d EDS130524.M Tue May 28 07:59:09 2013

Continuing Calibration Summary

Job Number: JB37147

Sample: GBK874-CC874

Account: ALNJ Accutest New Jersey

Lab FileID: BK25135.D

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Signal #1 : C:\msdchem\1\DATA\BK...24\BK25135.d\ECD1A.ch Vial: 100
 Signal #2 : C:\msdchem\1\DATA\BK130524\BK25135.d\ECD2B.ch
 Acq On : 24 May 2013 7:24 pm Operator: andrip
 Sample : cc874-20,edb-2 Inst : GCBK
 Misc : op33301,gbk874,30,,,50,,,s Multiplr: 1.00
 IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\msdchem\1\METHODS\EDS130524.M (ChemStation Integrator)
 Title : EDB /Rtx35/DB1701
 Last Update : Tue May 28 07:48:27 2013
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 85% Max. R.T. Dev 0.50min
 Max. RRF Dev : 15% Max. Rel. Area : 115%

	Compound	AvgRF	CCRF	% Dev	Area%	Dev(min)	RT	Window
----- True Calc. % Drift -----								
1	1,2-Dibromoethane	20.000	17.628	11.9	92	0.00	3.30-	3.36
----- AvgRF CCRF % Dev -----								
2 s	4-Bromofluorobenzene	12.491	11.483 E6	8.1	88	0.00	4.51-	4.57
3	1,2-Dibromo-3-chloropr	504.765	491.173 E6	2.7	94	0.00	5.93-	5.99
***** Signal #2 *****								

		True	Calc.	% Drift				
1	1,2-Dibromoethane	20.000	19.597	2.0	97	0.00	3.14-	3.20
----- AvgRF CCRF % Dev -----								
2 s	4-Bromofluorobenzene	202.862	194.516 E3	4.1	98	0.00	4.18-	4.24
3	1,2-Dibromo-3-chloropr	5.478	5.507 E6	-0.5	97	0.00	5.84-	5.90

(#) = Out of Range SPCC's out = 0 CCC's out = 0
 BK25108.d EDS130524.M Tue May 28 07:57:52 2013



GC Volatiles

Raw Data

(Accutest Labs of New England, Inc.)

Quantitation Report (QT Reviewed)

Manual Integrations
APPROVED
(compounds with "m" flag)
Andri Piluri
05/29/13 14:05

Data Path : C:\msdchem\1\DATA\BK130524\
Data File : BK25128.d
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch
Acq On : 24 May 2013 4:37 pm
Operator : andrip
Sample : jb37147-1,op33301
Misc : op33301,gbk874,30.10,,,50,,,s
ALS Vial : 14 Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: May 28 09:58:55 2013
Quant Method : C:\msdchem\1\METHODS\EDS130524.M
Quant Title : EDB /Rtx35/DB1701
QLast Update : Tue May 28 07:48:27 2013
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
----------	------	------	--------	--------	------	------

System Monitoring Compounds
2) s 4-Bromofl... 4.543 4.215 893.5E6 12794466 71.531m 63.070m
Spiked Amount 50.000 Range 26 - 158 Recovery = 143.06% 126.14%

Target Compounds
1) 1,2-Dibro... 0.000 0.000 0 N.D. N.D.
3) 1,2-Dibro... 0.000 0.000 0 N.D. N.D.

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

12.1.1

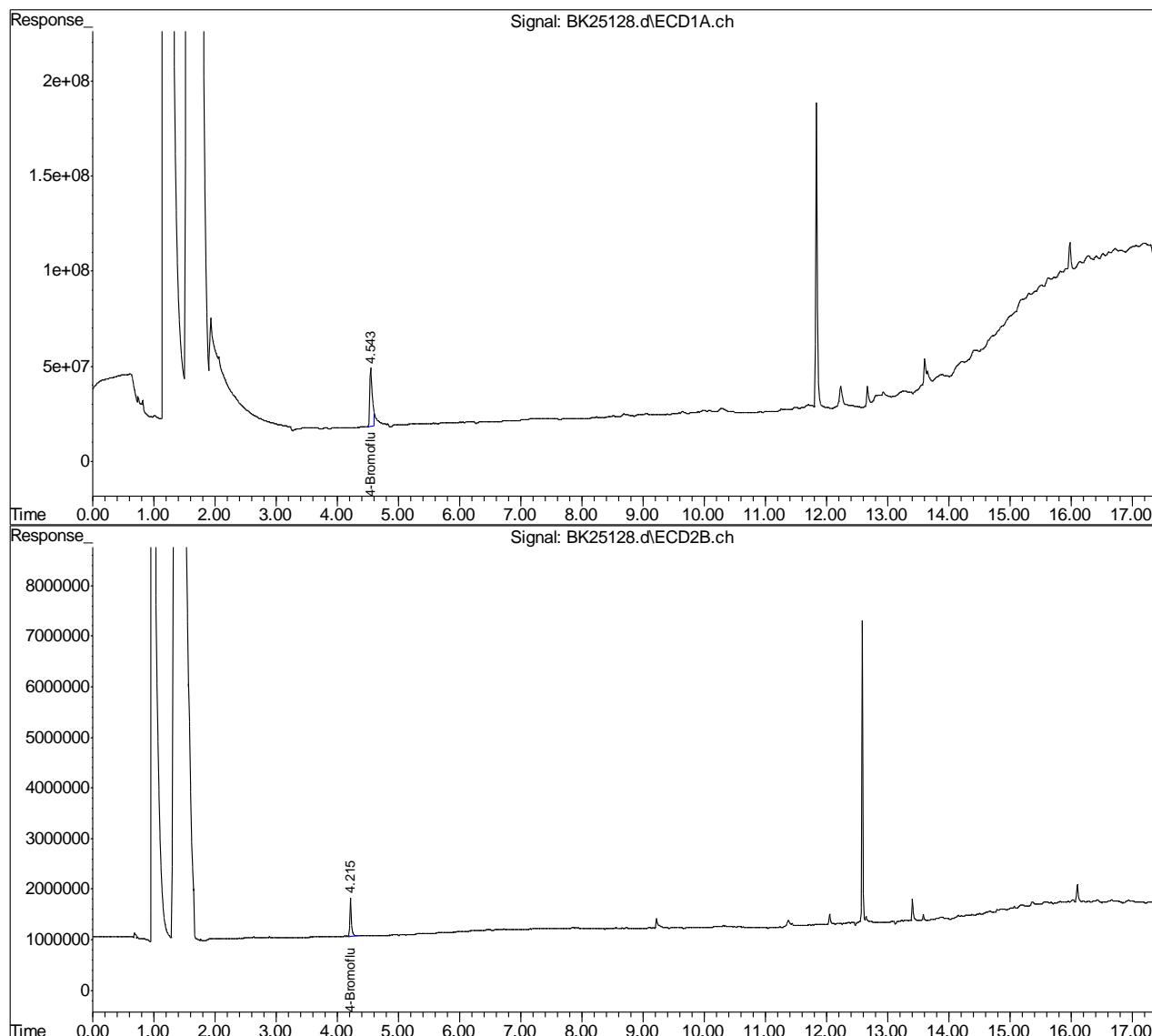
12

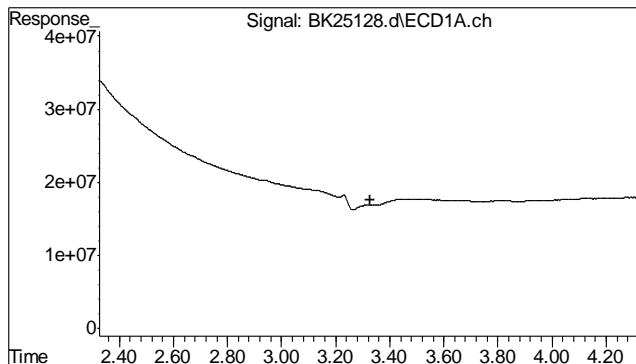
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\BK130524\
 Data File : BK25128.d
 Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch
 Acq On : 24 May 2013 4:37 pm
 Operator : andrip
 Sample : jb37147-1,op33301
 Misc : op33301,gbk874,30.10,,,50,,s
 ALS Vial : 14 Sample Multiplier: 1

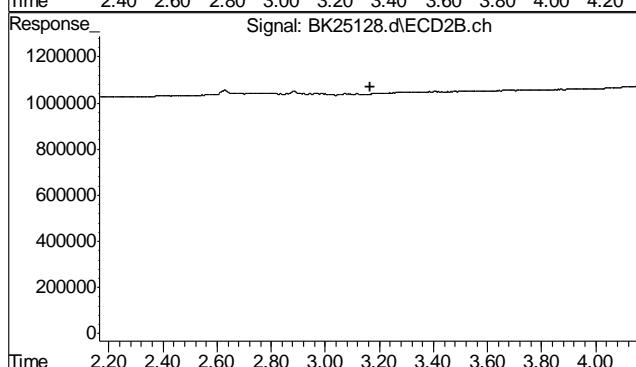
Integration File signal 1: events.e
 Integration File signal 2: events2.e
 Quant Time: May 28 09:58:55 2013
 Quant Method : C:\msdchem\1\METHODS\EDS130524.M
 Quant Title : EDB /Rtx35/DB1701
 QLast Update : Tue May 28 07:48:27 2013
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

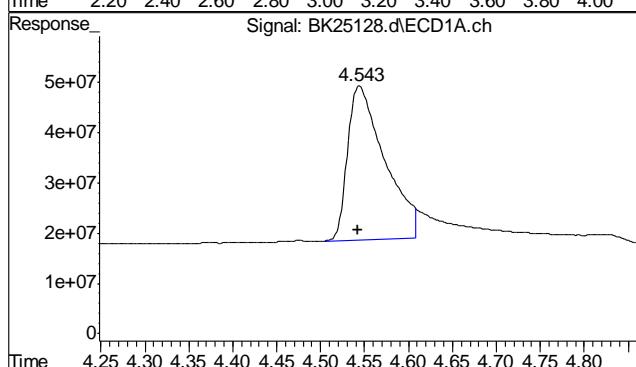




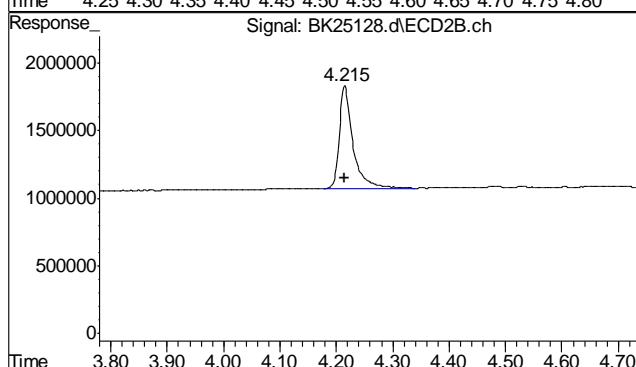
#1 1,2-Dibromoethane
R.T.: 0.000 min
Exp R.T.: 3.326 min
Response: 0
Conc: N.D.



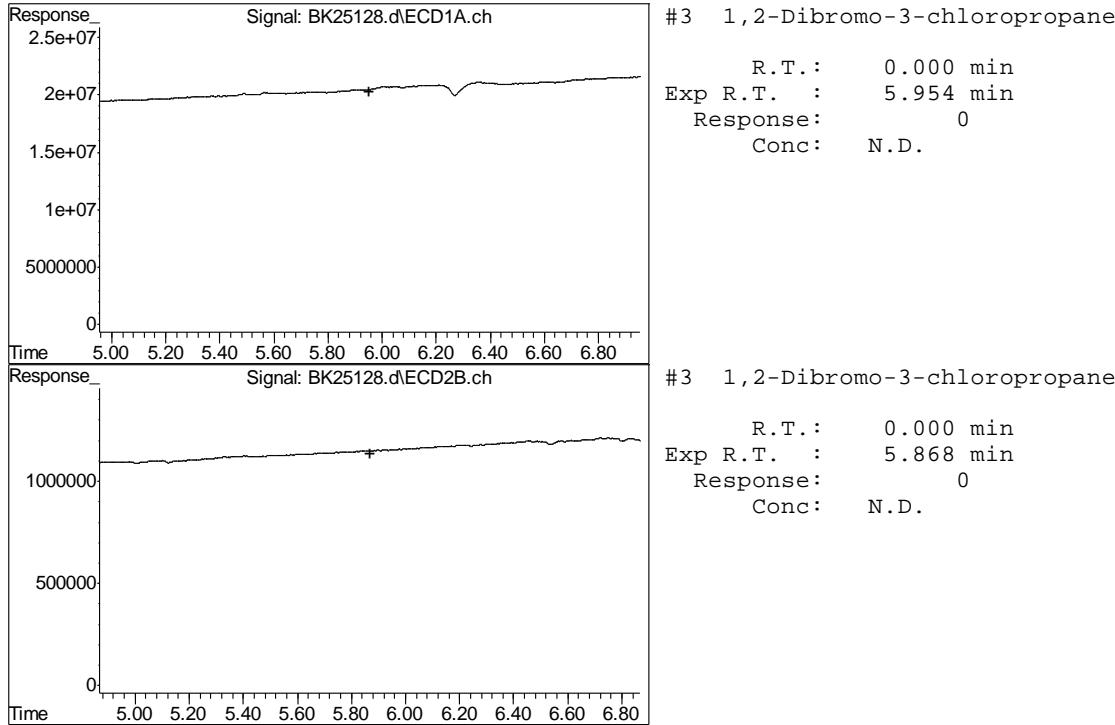
#1 1,2-Dibromoethane
R.T.: 0.000 min
Exp R.T.: 3.165 min
Response: 0
Conc: N.D.



#2 4-Bromofluorobenzene
R.T.: 4.543 min
Delta R.T.: 0.001 min
Response: 893524418
Conc: 71.53 ug/L m



#2 4-Bromofluorobenzene
R.T.: 4.215 min
Delta R.T.: 0.000 min
Response: 12794466
Conc: 63.07 ug/L m



12.1.1

12

Manual Integrations
APPROVED
 (compounds with "m" flag)
 Andri Piluri
 05/29/13 14:05

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\BK130524\
 Data File : BK25129.d
 Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch
 Acq On : 24 May 2013 5:01 pm
 Operator : andrip
 Sample : jb37147-2,op33301
 Misc : op33301,gbk874,30.60,,,50,,s
 ALS Vial : 15 Sample Multiplier: 1

Integration File signal 1: events.e
 Integration File signal 2: events2.e
 Quant Time: May 28 10:02:07 2013
 Quant Method : C:\msdchem\1\METHODS\EDS130524.M
 Quant Title : EDB /Rtx35/DB1701
 QLast Update : Tue May 28 07:48:27 2013
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
----------	------	------	--------	--------	------	------

System Monitoring Compounds

2) s 4-Bromofl...	4.543	4.214	846.3E6	12384360	67.754m	61.048m
Spiked Amount	50.000	Range	26 - 158	Recovery	= 135.51%	122.10%

Target Compounds

1) 1,2-Dibro...	0.000	0.000	0	0	N.D.	N.D.
3) 1,2-Dibro...	0.000	0.000	0	0	N.D.	N.D.

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

12.1.2

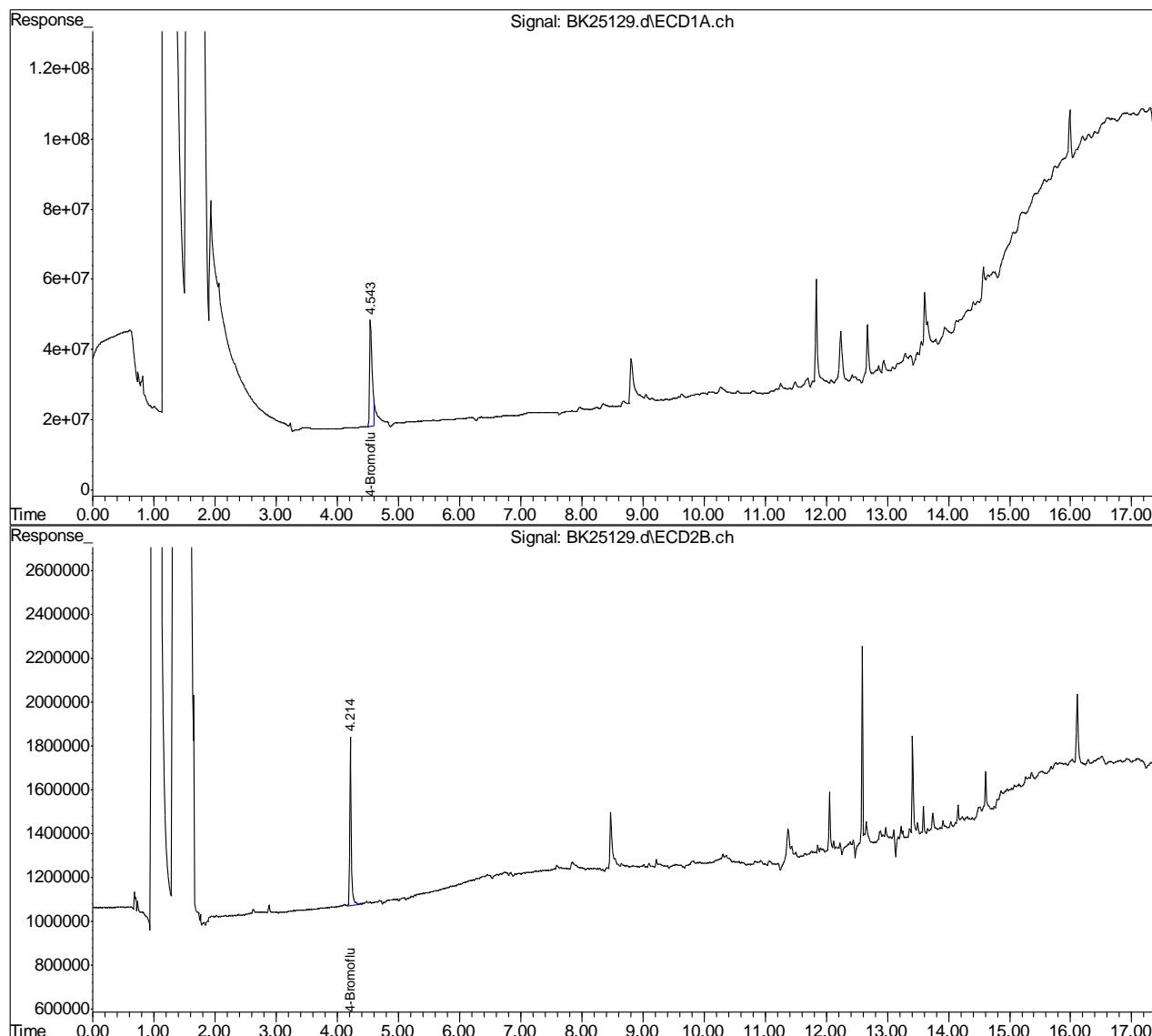
12

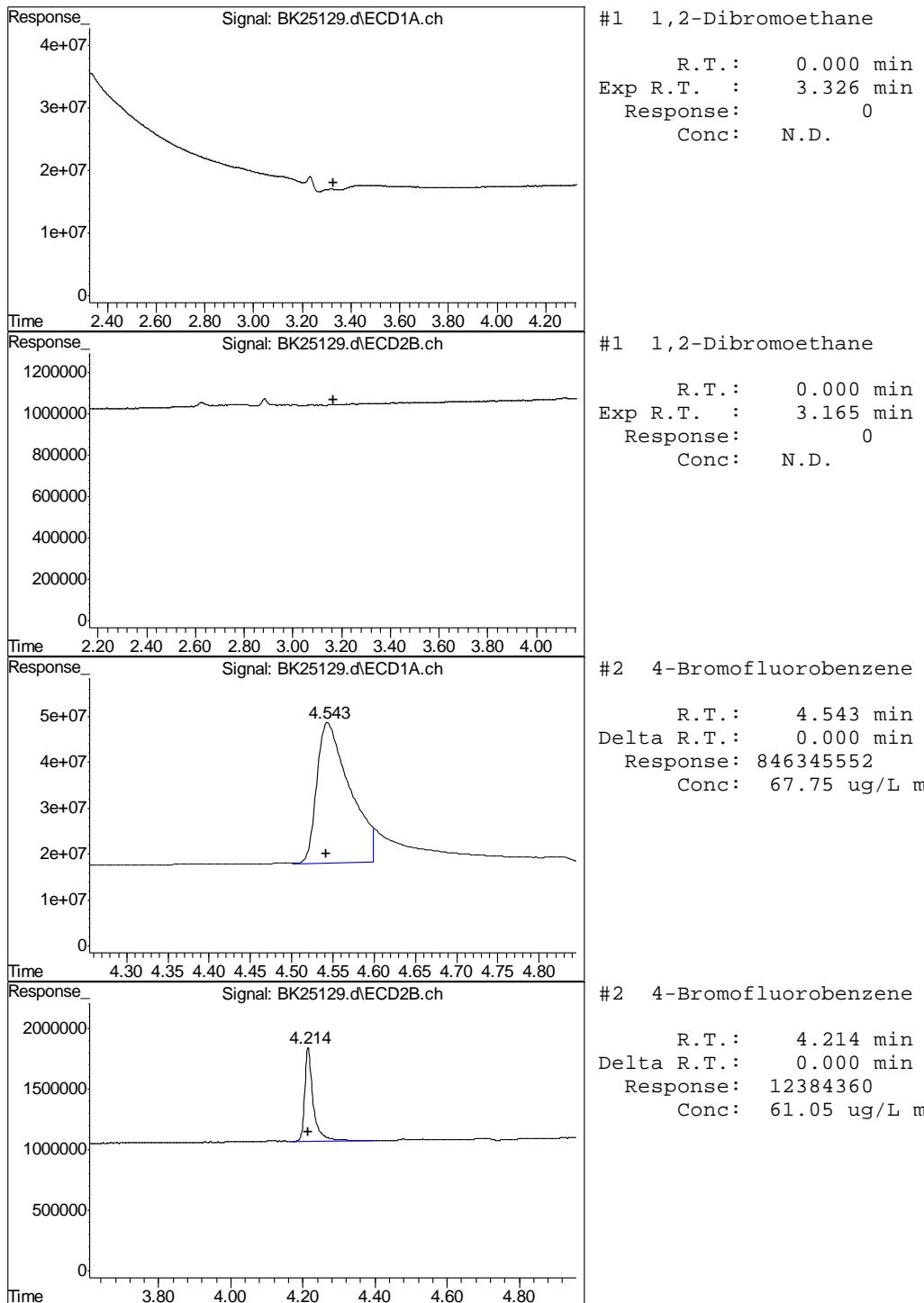
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\BK130524\
 Data File : BK25129.d
 Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch
 Acq On : 24 May 2013 5:01 pm
 Operator : andrip
 Sample : jb37147-2,op33301
 Misc : op33301,gbk874,30.60,,,50,,s
 ALS Vial : 15 Sample Multiplier: 1

Integration File signal 1: events.e
 Integration File signal 2: events2.e
 Quant Time: May 28 10:02:07 2013
 Quant Method : C:\msdchem\1\METHODS\EDS130524.M
 Quant Title : EDB /Rtx35/DB1701
 QLast Update : Tue May 28 07:48:27 2013
 Response via : Initial Calibration
 Integrator: ChemStation

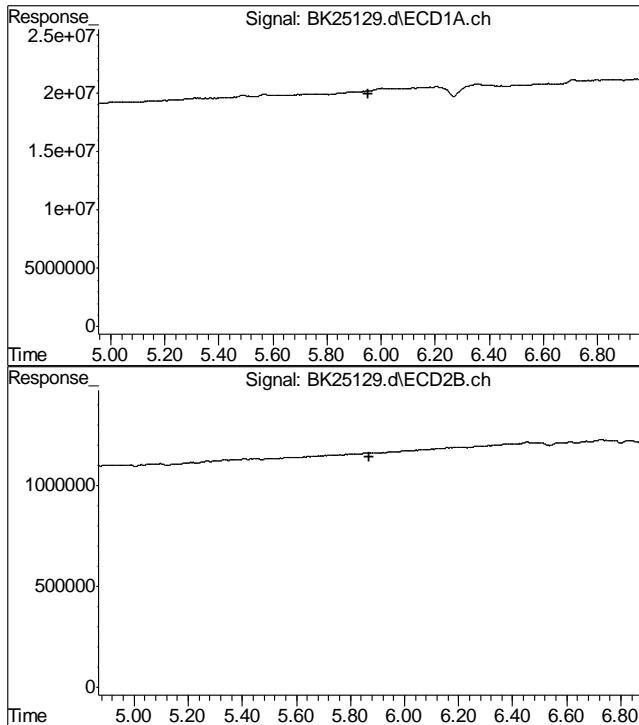
Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :





12.1.2

12



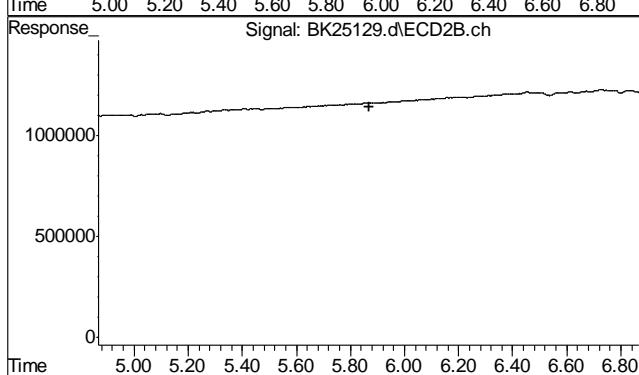
#3 1,2-Dibromo-3-chloropropane

R.T.: 0.000 min

Exp R.T. : 5.954 min

Response: 0

Conc: N.D.



#3 1,2-Dibromo-3-chloropropane

R.T.: 0.000 min

Exp R.T. : 5.868 min

Response: 0

Conc: N.D.

Quantitation Report (QT Reviewed)

Manual Integrations
APPROVED
(compounds with "m" flag)
Andri Piluri
05/29/13 14:05

Data Path : C:\msdchem\1\DATA\BK130524\
Data File : BK25130.d
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch
Acq On : 24 May 2013 5:25 pm
Operator : andrip
Sample : jb37147-3,op33301
Misc : op33301,gbk874,30.05,,,50,,s
ALS Vial : 16 Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: May 28 10:02:23 2013
Quant Method : C:\msdchem\1\METHODS\EDS130524.M
Quant Title : EDB /Rtx35/DB1701
QLast Update : Tue May 28 07:48:27 2013
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
----------	------	------	--------	--------	------	------

System Monitoring Compounds
2) s 4-Bromofl... 4.543 4.213 964.1E6 12955658 77.178m 63.864m
Spiked Amount 50.000 Range 26 - 158 Recovery = 154.36% 127.73%

Target Compounds
1) 1,2-Dibro... 0.000 0.000 0 0 N.D. N.D.
3) 1,2-Dibro... 0.000 0.000 0 0 N.D. N.D.

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

12.1.3

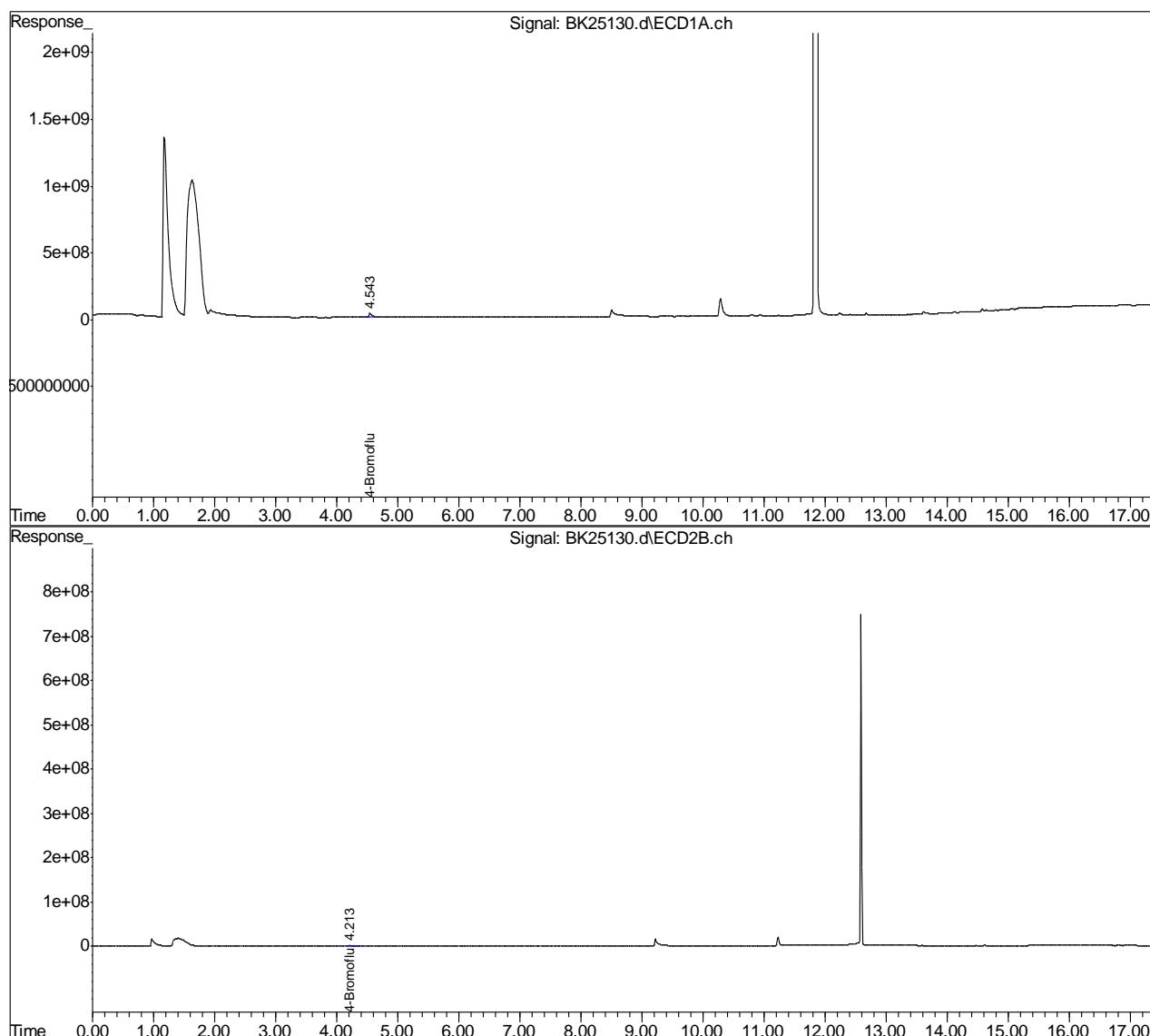
12

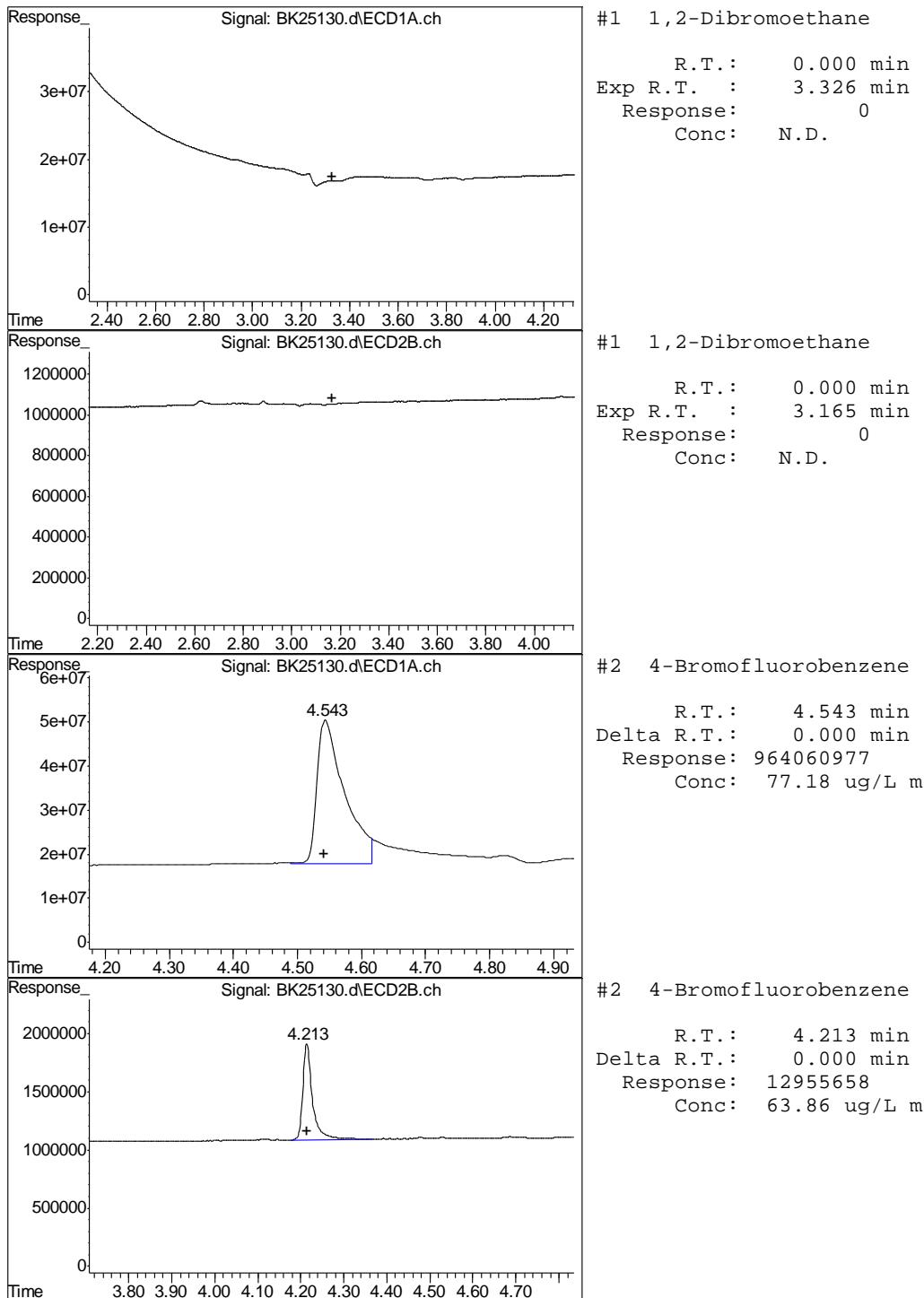
Quantitation Report (QT Reviewed)

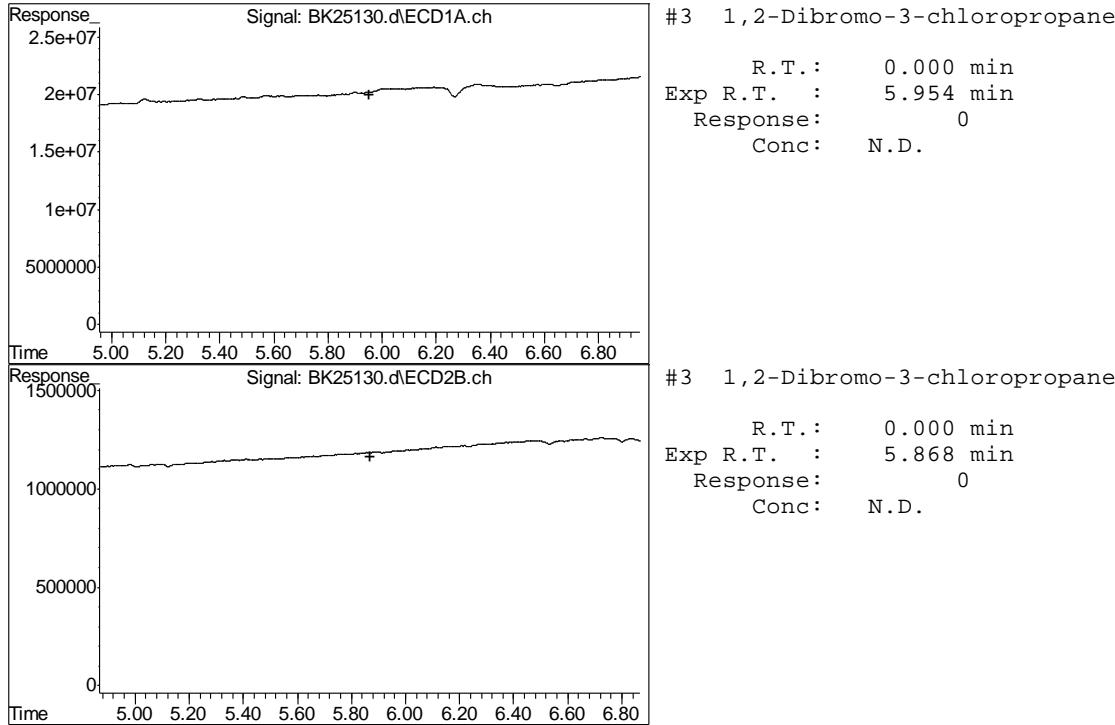
Data Path : C:\msdchem\1\DATA\BK130524\
 Data File : BK25130.d
 Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch
 Acq On : 24 May 2013 5:25 pm
 Operator : andrip
 Sample : jb37147-3,op33301
 Misc : op33301,gbk874,30.05,,,50,,s
 ALS Vial : 16 Sample Multiplier: 1

Integration File signal 1: events.e
 Integration File signal 2: events2.e
 Quant Time: May 28 10:02:23 2013
 Quant Method : C:\msdchem\1\METHODS\EDS130524.M
 Quant Title : EDB /Rtx35/DB1701
 QLast Update : Tue May 28 07:48:27 2013
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :







12.1.3

12

Quantitation Report (QT Reviewed)

Manual Integrations
APPROVED
(compounds with "m" flag)
Andri Piluri
05/29/13 14:05

Data Path : C:\msdchem\1\DATA\BK130524\
Data File : BK25131.d
Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch
Acq On : 24 May 2013 5:48 pm
Operator : andrip
Sample : jb37147-4,op33301
Misc : op33301,gbk874,30.38,,,50,,s
ALS Vial : 17 Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: May 28 10:02:35 2013
Quant Method : C:\msdchem\1\METHODS\EDS130524.M
Quant Title : EDB /Rtx35/DB1701
QLast Update : Tue May 28 07:48:27 2013
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
----------	------	------	--------	--------	------	------

System Monitoring Compounds
2) s 4-Bromofl... 4.543 4.213 928.6E6 12013737 74.339m 59.221m
Spiked Amount 50.000 Range 26 - 158 Recovery = 148.68% 118.44%

Target Compounds
1) 1,2-Dibro... 0.000 0.000 0 N.D. N.D.
3) 1,2-Dibro... 0.000 0.000 0 N.D. N.D.

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

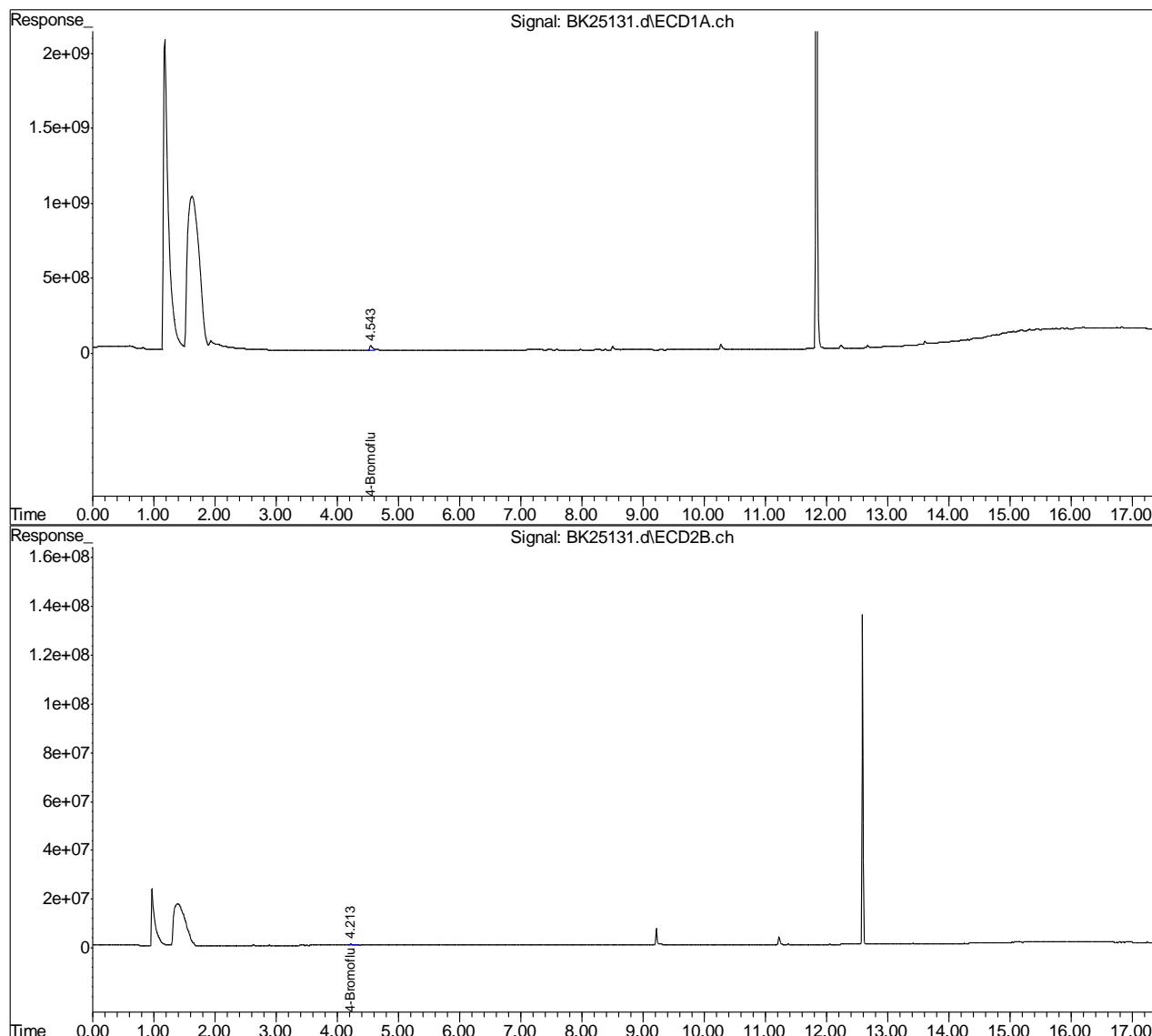
12.1.4
12

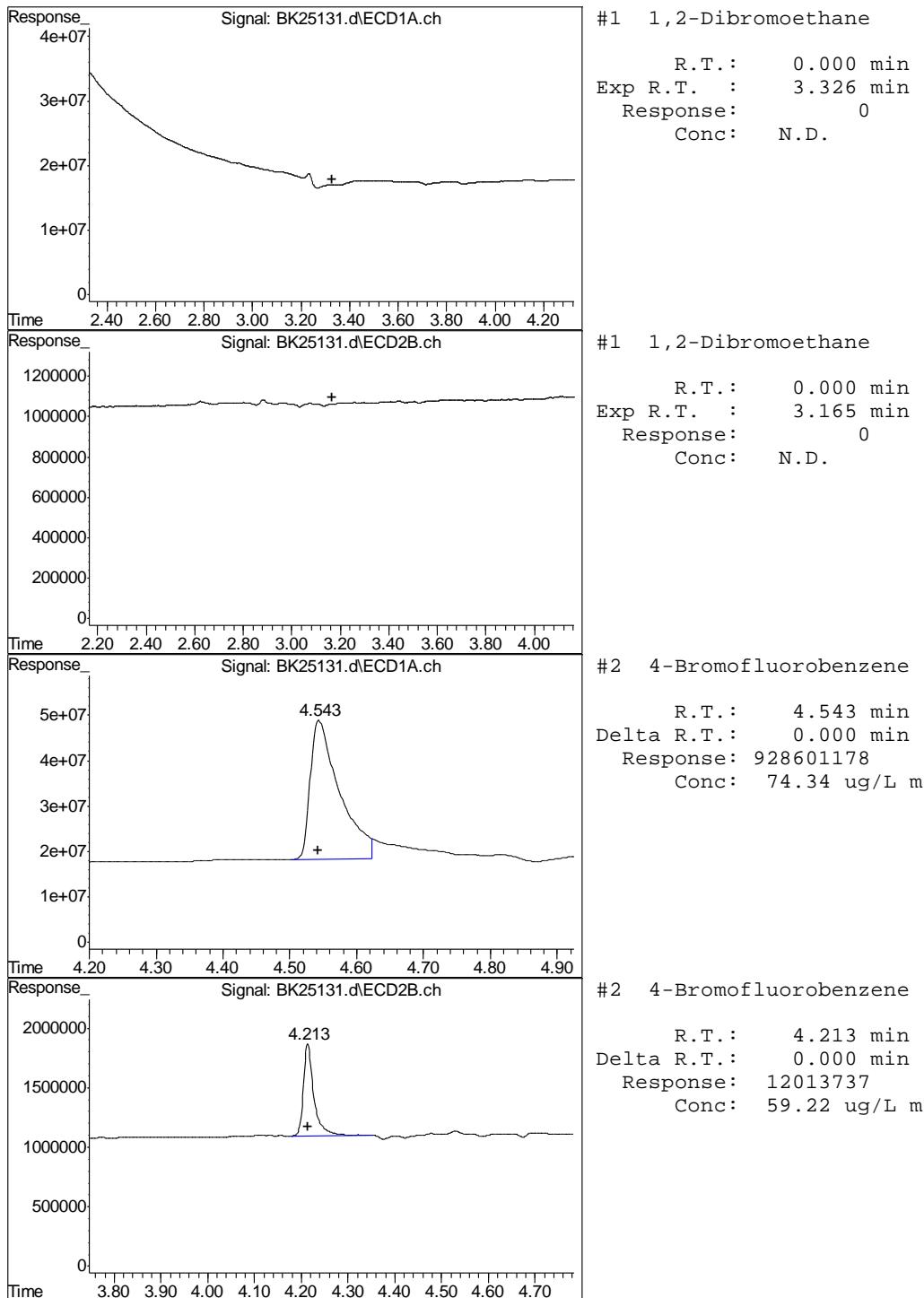
Quantitation Report (QT Reviewed)

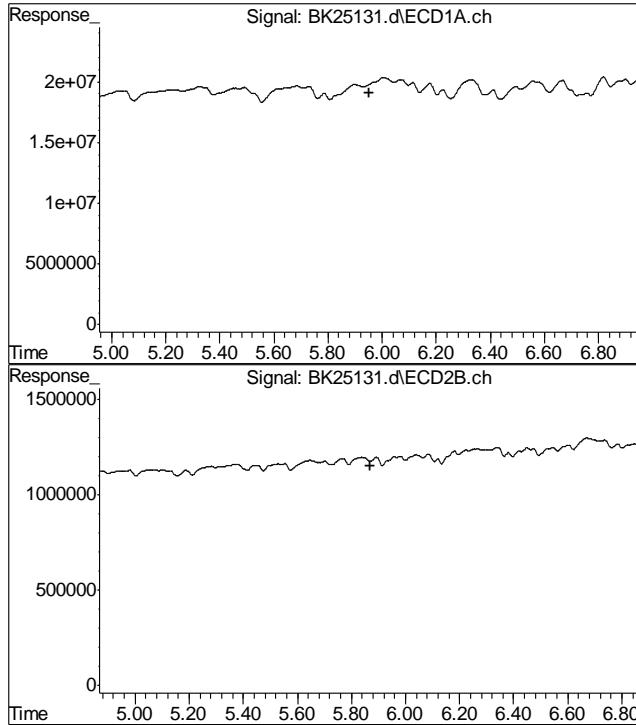
Data Path : C:\msdchem\1\DATA\BK130524\
 Data File : BK25131.d
 Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch
 Acq On : 24 May 2013 5:48 pm
 Operator : andrip
 Sample : jb37147-4,op33301
 Misc : op33301,gbk874,30.38,,,50,,s
 ALS Vial : 17 Sample Multiplier: 1

Integration File signal 1: events.e
 Integration File signal 2: events2.e
 Quant Time: May 28 10:02:35 2013
 Quant Method : C:\msdchem\1\METHODS\EDS130524.M
 Quant Title : EDB /Rtx35/DB1701
 QLast Update : Tue May 28 07:48:27 2013
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :







#3 1,2-Dibromo-3-chloropropane

R.T.: 0.000 min
Exp R.T. : 5.954 min
Response: 0
Conc: N.D.

#3 1,2-Dibromo-3-chloropropane

R.T.: 0.000 min
Exp R.T. : 5.868 min
Response: 0
Conc: N.D.

Manual Integrations
APPROVED
(compounds with "m" flag)
Andri Piluri
05/29/13 14:05

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\BK130524\
 Data File : BK25114.d
 Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch
 Acq On : 24 May 2013 11:20 am
 Operator : andrip
 Sample : op33301-mb
 Misc : op33301,gbk874,30.31,,,50,,s
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: events.e
 Integration File signal 2: events2.e
 Quant Time: May 28 09:55:38 2013
 Quant Method : C:\msdchem\1\METHODS\EDS130524.M
 Quant Title : EDB /Rtx35/DB1701
 QLast Update : Tue May 28 07:48:27 2013
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
----------	------	------	--------	--------	------	------

System Monitoring Compounds

2) s 4-Bromofl...	4.540	4.212	836.9E6	12689044	66.996m	62.550m
Spiked Amount	50.000	Range	26 - 158	Recovery	= 133.99%	125.10%

Target Compounds

1) 1,2-Dibro...	0.000	0.000	0	0	N.D.	N.D.
3) 1,2-Dibro...	0.000	0.000	0	0	N.D.	N.D.

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

12.2.1

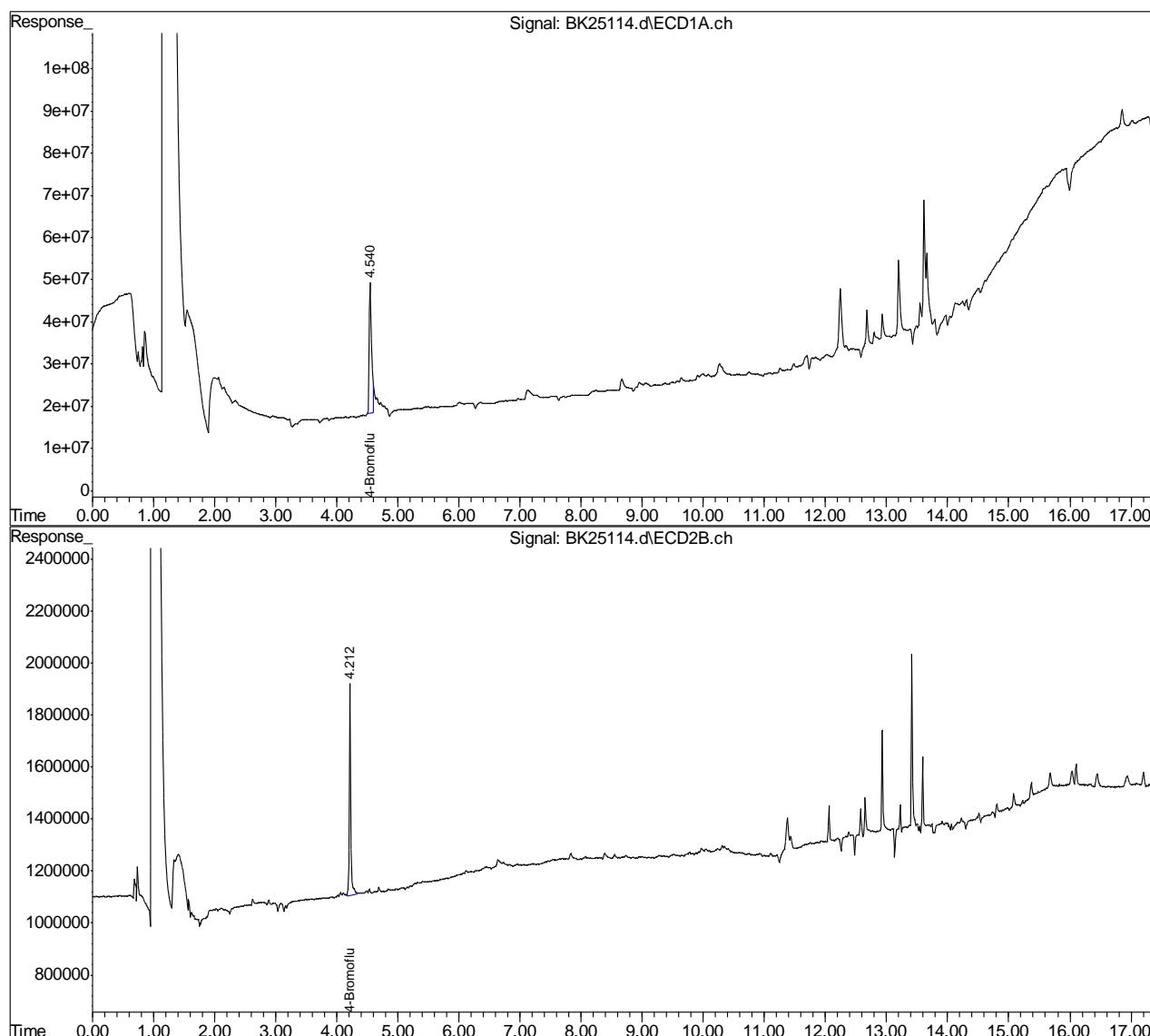
12

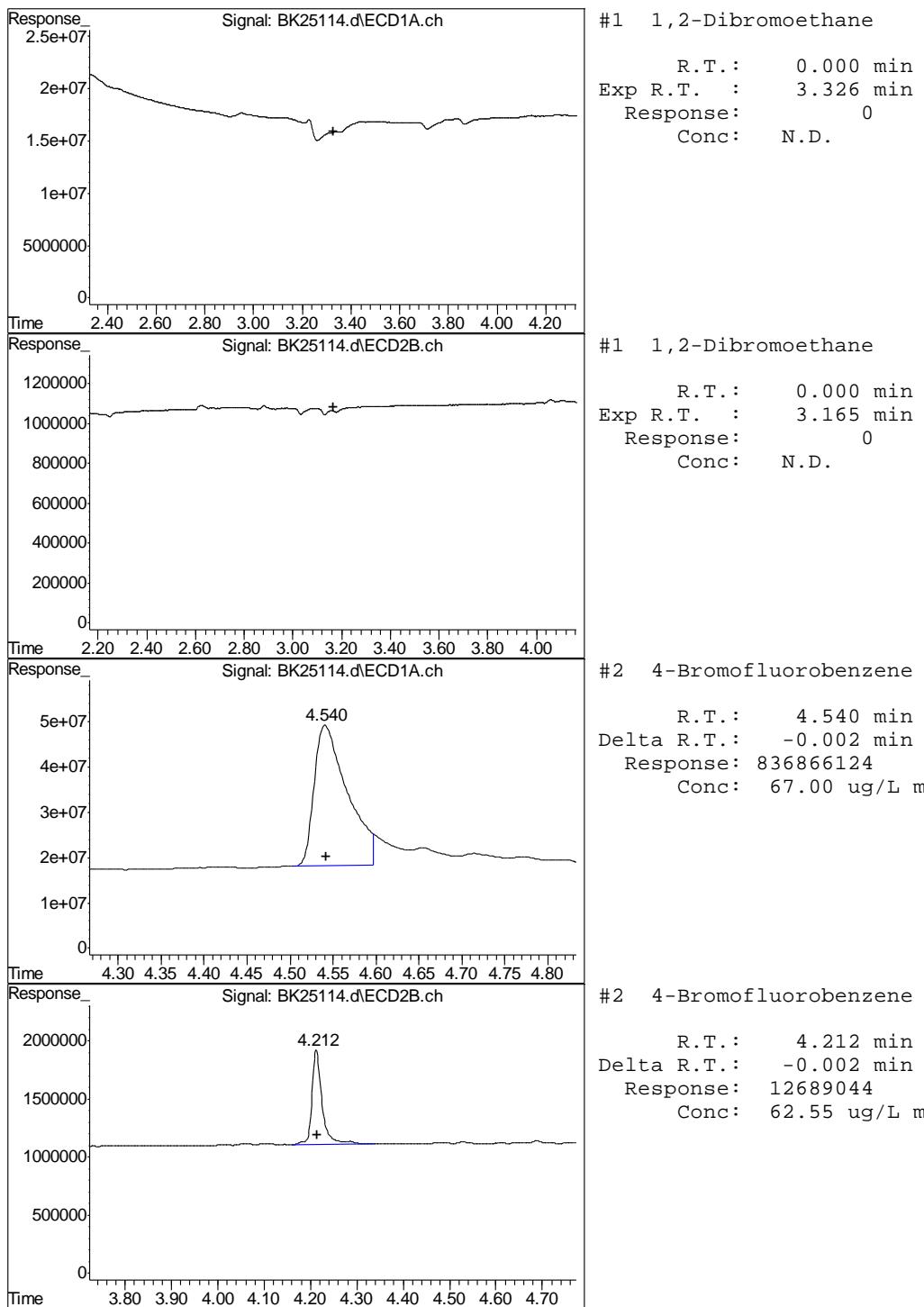
Quantitation Report (QT Reviewed)

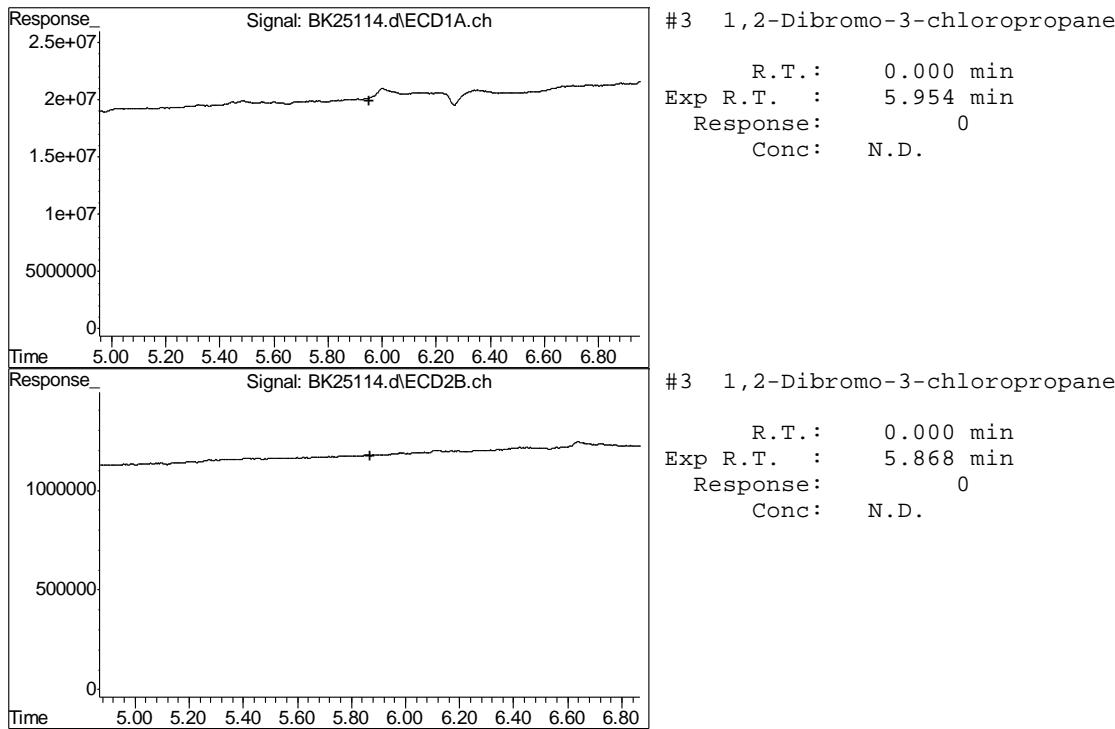
Data Path : C:\msdchem\1\DATA\BK130524\
 Data File : BK25114.d
 Signal(s) : Signal #1: ECD1A.ch Signal #2: ECD2B.ch
 Acq On : 24 May 2013 11:20 am
 Operator : andrip
 Sample : op33301-mb
 Misc : op33301,gbk874,30.31,,,50,,s
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: events.e
 Integration File signal 2: events2.e
 Quant Time: May 28 09:55:38 2013
 Quant Method : C:\msdchem\1\METHODS\EDS130524.M
 Quant Title : EDB /Rtx35/DB1701
 QLast Update : Tue May 28 07:48:27 2013
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :







12.2.1

12



Metals Analysis

QC Data Summaries

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Instrument Runlogs
- Initial and Continuing Calibration Blanks
- Initial and Continuing Calibration Checks
- High and Low Check Standards
- Interfering Element Check Standards
- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP

Date Analyzed: 05/23/13

Methods: SW846 6010B, SW846 6010C

Analyst: EAL

Run ID: MA15650

Parameters: Pb

Time	Sample Description	Dilution Factor	PS Recov	Comments
16:25	MA15650-STD1	1		STD1
16:30	MA15650-STD2	1		STD2
16:34	MA15650-STD3	1		STD3
16:38	MA15650-STD4	1		STD4
16:43	MA15650-ICV1	1		
16:50	MA15650-ICB1	1		
16:54	MA15650-CCV1	1		
17:01	MA15650-CCB1	1		
17:05	MA15650-CRIA1	1		
17:09	MA15650-ICSA1	1		
17:14	MA15650-ICSAB1	1		
17:18	MP21038-B1	1		
17:22	MP21038-MB1	1		
17:27	MP21038-S1	1		MS OUT FOR SB, NEED PS.
17:31	MP21038-S2	1		
17:35	MC21064-9	1		(sample used for QC only; not part of login JB37147)
17:39	MP21038-SD1	5		
17:44	MP21038-B2	1		
17:48	MA15650-CCV2	1		
17:52	MA15650-CCB2	1		
17:56	MP21038-LC1	1		
18:01	ZZZZZ	1		
18:05	ZZZZZ	1		
18:10	ZZZZZ	1		
18:14	ZZZZZ	1		
18:18	ZZZZZ	1		
18:23	ZZZZZ	1		
18:27	ZZZZZ	1		
18:31	ZZZZZ	1		
18:36	ZZZZZ	1		
18:40	MA15650-CCV3	1		
18:44	MA15650-CCB3	1		
18:48	ZZZZZ	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP

Date Analyzed: 05/23/13

Methods: SW846 6010B, SW846 6010C

Analyst: EAL

Run ID: MA15650

Parameters: Pb

Time	Sample Description	Dilution Factor	PS Recov	Comments
18:53	ZZZZZZ	1		
18:57	ZZZZZZ	1		
19:02	ZZZZZZ	1		
19:06	ZZZZZZ	1		
19:10	ZZZZZZ	1		
19:15	ZZZZZZ	1		
19:19	ZZZZZZ	1		
19:23	MP21038-PS1	1		
19:28	MP21026-B1	1		
19:32	MA15650-CCV4	1		
19:36	MA15650-CCB4	1		
19:40	MP21026-MB1	1		
19:45	MP21026-S1	1		MS OUT FOR SB, NEED PS.
19:49	MP21026-S2	1		
19:54	MC21006-6	1		(sample used for QC only; not part of login JB37147)
19:58	MP21026-SD1	5		
20:02	MP21026-LC1	1		
20:07	JB37147-1	1		
20:11	JB37147-3	1		
20:15	JB37147-4	1		
20:20	ZZZZZZ	1		
20:24	MA15650-CCV5	1		
20:29	MA15650-CCB5	1		
20:33	JB37147-2	1		MN NO READING DUE TO OVER SATURATED.
-----> Last reportable sample/prep for job JB37147				
20:38	ZZZZZZ	1		
20:42	ZZZZZZ	1		
20:47	ZZZZZZ	1		
20:51	ZZZZZZ	1		
20:55	ZZZZZZ	1		
21:00	ZZZZZZ	1		
21:04	ZZZZZZ	1		
21:09	ZZZZZZ	1		
21:14	ZZZZZZ	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP

Date Analyzed: 05/23/13

Methods: SW846 6010B, SW846 6010C

Analyst: EAL

Run ID: MA15650

Parameters: Pb

Time	Sample Description	Dilution Factor	PS Recov	Comments
21:18	MA15650-CCV6	1		
21:22	MA15650-CCB6	1		
21:27	ZZZZZZ	1		
21:31	ZZZZZZ	1		
21:36	ZZZZZZ	1		
21:40	ZZZZZZ	1		
21:45	ZZZZZZ	1		
21:49	ZZZZZZ	1		
21:53	ZZZZZZ	1		
21:58	ZZZZZZ	2		
22:02	ZZZZZZ	2		
22:07	MA15650-CCV7	1		
22:11	MA15650-CCB7	1		
22:15	MA15650-CRIA2	1		
22:20	MA15650-ICSA2	1		
22:24	MA15650-ICSAB2	1		
22:29	MA15650-CCV8	1		
22:33	MA15650-CCB8	1		
-----> Last reportable CCB for job JB37147				
22:37	MP21023-B1	1		
22:41	MP21023-B2	1		
22:46	MP21023-MB1	1		
22:50	MP21023-MB2	1		
22:54	MC20881-71	1		(sample used for QC only; not part of login JB37147)
22:59	MP21023-SD1	5		
23:03	ZZZZZZ	1		DNR: FOR INTERNAL QC USE ONLY.
23:07	ZZZZZZ	1		
23:12	ZZZZZZ	1		
23:16	ZZZZZZ	1		
23:20	MA15650-CCV9	1		
23:24	MA15650-CCB9	1		
23:29	ZZZZZZ	1		
23:33	ZZZZZZ	1		
23:38	ZZZZZZ	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP

Date Analyzed: 05/23/13

Methods: SW846 6010B, SW846 6010C

Analyst: EAL

Run ID: MA15650

Parameters: Pb

Time	Sample Description	Dilution Factor	PS Recov	Comments
23:42	ZZZZZZ	1		
23:46	ZZZZZZ	1		
23:51	ZZZZZZ	1		
23:55	ZZZZZZ	1		
23:59	ZZZZZZ	1		
00:04	ZZZZZZ	1		
00:08	ZZZZZZ	1		
00:12	MA15650-CCV10	1		
00:17	MA15650-CCB10	1		
00:21	ZZZZZZ	1		
00:25	ZZZZZZ	1		
00:30	ZZZZZZ	1		
00:34	ZZZZZZ	1		
00:38	ZZZZZZ	1		
00:42	ZZZZZZ	1		
00:47	MP21024-B1	1		
00:51	MP21024-B2	1		
00:55	MP21024-MB1	1		
01:00	MP21024-MB2	1		
01:04	MA15650-CCV11	1		
01:08	MA15650-CCB11	1		
01:13	MC20922-18	1		(sample used for QC only; not part of login JB37147)
01:17	MP21024-SD1	5		
01:21	ZZZZZZ	1		DNR: FOR INTERNAL QC USE ONLY.
01:26	ZZZZZZ	1		
01:30	ZZZZZZ	1		
01:34	ZZZZZZ	1		
01:38	ZZZZZZ	1		
01:43	ZZZZZZ	1		
01:47	ZZZZZZ	1		
01:51	ZZZZZZ	1		
01:56	MA15650-CCV12	1		
02:00	MA15650-CCB12	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP

Date Analyzed: 05/23/13

Methods: SW846 6010B, SW846 6010C

Analyst: EAL

Run ID: MA15650

Parameters: Pb

Time	Sample Description	Dilution Factor	PS Recov	Comments
02:04	ZZZZZZ	1		
02:09	ZZZZZZ	1		
02:13	ZZZZZZ	1		
02:17	ZZZZZZ	1		
02:22	ZZZZZZ	1		
02:26	ZZZZZZ	1		
02:30	ZZZZZZ	1		
02:35	ZZZZZZ	1		
02:39	ZZZZZZ	1		
02:43	ZZZZZZ	1		
02:48	MA15650-CCV13	1		
02:52	MA15650-CCB13	1		
02:56	ZZZZZZ	1		
03:01	ZZZZZZ	1		
03:05	ZZZZZZ	1		RINSECONF
03:09	MA15650-CRIA3	1		
03:14	MA15650-CRIB1	1		
03:18	MP21025-LS2	1		
03:23	MP21025-LS2	3		
03:27	ZZZZZZ	1		RINSECONF
03:31	MA15650-CCV14	1		
03:36	MA15650-CCB14	1		
03:40	MA15650-CRIB2	1		
03:44	MA15650-ICSA3	1		
03:49	MA15650-ICSAB3	1		
03:53	MA15650-CCV15	1		
03:58	MA15650-CCB15	1		

Refer to raw data for calibration curve and standards.

INTERNAL STANDARD SUMMARY

Login Number: JB37147
 Account: ALNJ - Accutest New Jersey
 Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP Date Analyzed: 05/23/13 Methods: SW846 6010B, SW846 6010C
 Analyst: EAL Run ID: MA15650
 Parameters: Pb

Time	Sample Description	Istd#1	Istd#2	Istd#3
16:25	MA15650-STD1	1697 R	73460 R	16166 R
16:30	MA15650-STD2	1676	73513	16159
16:34	MA15650-STD3			16094
16:38	MA15650-STD4	1693	73507	15997
16:43	MA15650-ICV1	1674	73448	16055
16:50	MA15650-ICB1	1706	73433	16117
16:54	MA15650-CCV1	1697	73560	16192
17:01	MA15650-CCB1	1702	73139	16246
17:05	MA15650-CRIA1	1698	73304	16127
17:09	MA15650-ICSA1	1541	69037	15803
17:14	MA15650-ICSAB1	1535	64110	15797
17:18	MP21038-B1	1679	73574	16152
17:22	MP21038-MB1	1711	73542	16359
17:27	MP21038-S1	1776	77341	17291
17:31	MP21038-S2	1762	77408	17029
17:35	MC21064-9	1793	78685	17188
17:39	MP21038-SD1	1718	75017	16501
17:44	MP21038-B2	1688	73656	15996
17:48	MA15650-CCV2	1701	74881	16395
17:52	MA15650-CCB2	1707	74282	16244
17:56	MP21038-LC1	1823	80282	17845
18:01	ZZZZZZ	1880	83762	18517
18:05	ZZZZZZ	2207 !a	98935 !a	22136 !a
18:10	ZZZZZZ	1766	79942	17837
18:14	ZZZZZZ	1930	85987	18970
18:18	ZZZZZZ	1895	84221	18524
18:23	ZZZZZZ	1901	84091	18329
18:27	ZZZZZZ	2026	89860	19750
18:31	ZZZZZZ	1839	81092	17936
18:36	ZZZZZZ	2313 !a	103080 !a	22856 !a
18:40	MA15650-CCV3	1702	74784	16506
18:44	MA15650-CCB3	1706	73736	16207
18:48	ZZZZZZ	1779	79152	17692

INTERNAL STANDARD SUMMARY

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP

Date Analyzed: 05/23/13

Methods: SW846 6010B, SW846 6010C

Analyst: EAL

Run ID: MA15650

Parameters: Pb

Time	Sample Description	Istd#1	Istd#2	Istd#3
18:53	ZZZZZZ	1809	80073	17901
18:57	ZZZZZZ	1823	80325	17971
19:02	ZZZZZZ	1775	78670	17481
19:06	ZZZZZZ	1757	77822	17507
19:10	ZZZZZZ	1783	78693	17370
19:15	ZZZZZZ	1787	79740	17421
19:19	ZZZZZZ	2267 !a	102750 !a	23127 !a
19:23	MP21038-PS1	1790	79455	17212
19:28	MP21026-B1	1689	74459	16467
19:32	MA15650-CCV4	1709	75284	16673
19:36	MA15650-CCB4	1709	74138	16647
19:40	MP21026-MB1	1694	74779	16503
19:45	MP21026-S1	1922	86390	19175
19:49	MP21026-S2	1939	86840	19469
19:54	MC21006-6	1937	86373	19408
19:58	MP21026-SD1	1761	77555	17307
20:02	MP21026-LC1	1818	81252	18278
20:07	JB37147-1	1879	83263	18397
20:11	JB37147-3	1859	83166	18263
20:15	JB37147-4	1845	82353	18169
20:20	ZZZZZZ	2028	90910	20270
20:24	MA15650-CCV5	1704	75223	16771
20:29	MA15650-CCB5	1713	74261	16474
20:33	JB37147-2	1539	69948	16411
20:38	ZZZZZZ	1761	78788	17702
20:42	ZZZZZZ	1871	82625	18506
20:47	ZZZZZZ	1755	77588	17578
20:51	ZZZZZZ	2060	91277	20647
20:55	ZZZZZZ	1752	78716	18225
21:00	ZZZZZZ	1697	77695	17737
21:04	ZZZZZZ	1736	79790	17857
21:09	ZZZZZZ	1707	78094	17464
21:14	ZZZZZZ	1684	76185	17503

INTERNAL STANDARD SUMMARY

Login Number: JB37147
 Account: ALNJ - Accutest New Jersey
 Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP Date Analyzed: 05/23/13 Methods: SW846 6010B, SW846 6010C
 Analyst: EAL Run ID: MA15650
 Parameters: Pb

Time	Sample Description	Istd#1	Istd#2	Istd#3
21:18	MA15650-CCV6	1717	75724	16627
21:22	MA15650-CCB6	1728	75448	16602
21:27	ZZZZZZ	1777	80098	18036
21:31	ZZZZZZ	1706	76817	17651
21:36	ZZZZZZ	1693	76754	17676
21:40	ZZZZZZ	1759	79291	18087
21:45	ZZZZZZ	1724	78108	17875
21:49	ZZZZZZ	1804	80303	17772
21:53	ZZZZZZ	1846	81675	18255
21:58	ZZZZZZ	1983	88666	19848
22:02	ZZZZZZ	2011	89640	20059
22:07	MA15650-CCV7	1707	75911	16868
22:11	MA15650-CCB7	1717	73001	16797
22:15	MA15650-CRIA2	1724	75408	16800
22:20	MA15650-ICSA2	1587	71149	16582
22:24	MA15650-ICSAB2	1578	70562	16669
22:29	MA15650-CCV8	1716	76073	17012
22:33	MA15650-CCB8	1721	75499	16889
22:37	MP21023-B1	1685.5	74344	16843
22:41	MP21023-B2	1695.8	74950	16992
22:46	MP21023-MB1	1707.5	75344	16946
22:50	MP21023-MB2	1718.3	75637	17049
22:54	MC20881-71	1699.2	75032	17001
22:59	MP21023-SD1	1723.6	76086	17090
23:03	ZZZZZZ	1829	82494	18652
23:07	ZZZZZZ	1697.7	75315	17027
23:12	ZZZZZZ	1705.7	75558	17070
23:16	ZZZZZZ	1709.1	75445	17013
23:20	MA15650-CCV9	1716	76708	17099
23:24	MA15650-CCB9	1731	75879	16935
23:29	ZZZZZZ	1698	75295	17083
23:33	ZZZZZZ	1707.9	75677	17168
23:38	ZZZZZZ	1711.3	75727	17065

INTERNAL STANDARD SUMMARY

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP

Date Analyzed: 05/23/13

Methods: SW846 6010B, SW846 6010C

Analyst: EAL

Run ID: MA15650

Parameters: Pb

Time	Sample Description	Istd#1	Istd#2	Istd#3
23:42	ZZZZZZ	1708.1	75540	17245
23:46	ZZZZZZ	1699.2	76334	17077
23:51	ZZZZZZ	1709.5	76154	16871
23:55	ZZZZZZ	1719.1	75927	16809
23:59	ZZZZZZ	1701.2	73042	16803
00:04	ZZZZZZ	1744.7	76108	17107
00:08	ZZZZZZ	1749.7	76238	17176
00:12	MA15650-CCV10	1749	76987	17043
00:17	MA15650-CCB10	1762	76547	16832
00:21	ZZZZZZ	1739.1	75607	17104
00:25	ZZZZZZ	1737.4	76247	17065
00:30	ZZZZZZ	1739.6	76217	17140
00:34	ZZZZZZ	1738.2	76541	17161
00:38	ZZZZZZ	1733.6	76246	17031
00:42	ZZZZZZ	1727.2	76515	17214
00:47	MP21024-B1	1706.2	75234	16886
00:51	MP21024-B2	1708.6	75675	16658
00:55	MP21024-MB1	1722.5	75482	16585
01:00	MP21024-MB2	1735	75822	16661
01:04	MA15650-CCV11	1738	76253	16480
01:08	MA15650-CCB11	1761	75471	16315
01:13	MC20922-18	1727.9	76369	16778
01:17	MP21024-SD1	1773.9	76666	16467
01:21	ZZZZZZ	1874	80829	17704
01:26	ZZZZZZ	1761	74055	16159
01:30	ZZZZZZ	1771.3	74174	16294
01:34	ZZZZZZ	1758.3	74558	16340
01:38	ZZZZZZ	1747.6	74925	16694
01:43	ZZZZZZ	1780.5	74263	16210
01:47	ZZZZZZ	1783.1	73793	16221
01:51	ZZZZZZ	1777.1	73834	16106
01:56	MA15650-CCV12	1801	74922	15985
02:00	MA15650-CCB12	1804	74342	15948

INTERNAL STANDARD SUMMARY

Login Number: JB37147
 Account: ALNJ - Accutest New Jersey
 Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP Date Analyzed: 05/23/13 Methods: SW846 6010B, SW846 6010C
 Analyst: EAL Run ID: MA15650
 Parameters: Pb

Time	Sample Description	Istd#1	Istd#2	Istd#3
02:04	ZZZZZZ	1785.4	73646	16077
02:09	ZZZZZZ	1786	73621	16058
02:13	ZZZZZZ	1789.9	72990	16102
02:17	ZZZZZZ	1781.2	73444	15986
02:22	ZZZZZZ	1793.2	73313	15995
02:26	ZZZZZZ	1787.4	72914	15863
02:30	ZZZZZZ	1790.8	73360	15957
02:35	ZZZZZZ	1791.2	72873	15738
02:39	ZZZZZZ	1791	73146	15910
02:43	ZZZZZZ	1792.2	72336	15764
02:48	MA15650-CCV13	1805	73711	15892
02:52	MA15650-CCB13	1819	72999	15766
02:56	ZZZZZZ	1800.2	73007	15912
03:01	ZZZZZZ	1798.8	72563	15716
03:05	ZZZZZZ	1829	72935	15539
03:09	MA15650-CRIA3	1822	72925	15820
03:14	MA15650-CRIB1	1822	73017	15695
03:18	MP21025-LS2	1669	66727	15576
03:23	MP21025-LS2	1767	70530	15858
03:27	ZZZZZZ	1826	72689	15826
03:31	MA15650-CCV14	1812	72922	15827
03:36	MA15650-CCB14	1823	71840	15572
03:40	MA15650-CRIB2	1825	72352	15566
03:44	MA15650-ICSA3	1662	67758	15384
03:49	MA15650-ICSAB3	1667	67911	15271
03:53	MA15650-CCV15	1819	72672	15738
03:58	MA15650-CCB15	1830	72426	15615

R = Reference for ISTD limits. ! = Outside limits.

LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %

(a) No element reported by this internal standard.

13.1.1
13

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB37147
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP Date Analyzed: 05/23/13 Methods: SW846 6010B, SW846 6010C
QC Limits: result < RL Run ID: MA15650 Units: ug/l

Metal	Time: Sample ID: RL	IDL	16:50 ICB1		17:01 CCB1		17:52 CCB2		18:44 CCB3		final
			raw	final	raw	final	raw	final	raw	final	
Aluminum	200	12	anr								
Antimony	6.0	1.1	anr								
Arsenic	10	1.7	anr								
Barium	500	.32	anr								
Beryllium	4.0	.1	anr								
Boron	100	1.1	anr								
Cadmium	4.0	.25	anr								
Calcium	5000	21	anr								
Chromium	10	.48	anr								
Cobalt	50	.29	anr								
Copper	25	.93	anr								
Gold	50	1.5									
Iron	100	3.5	anr								
Lead	10	1.2	1.0	<10	1.6	<10	1.5	<10	0.60	<10	
Magnesium	5000	30	anr								
Manganese	15	.16	anr								
Molybdenum	100	.31									
Nickel	40	.45	anr								
Palladium	50	2.2									
Platinum	50	6.4									
Potassium	5000	54	anr								
Selenium	25	1.7	anr								
Silicon	100	2									
Silver	5.0	.81	anr								
Sodium	5000	16	anr								
Strontium	10	.12									
Thallium	5.0	1.2	anr								
Tin	100	.87	anr								
Titanium	50	.66	anr								
Tungsten	100	9.3									
Vanadium	10	.82	anr								
Zinc	100	.45	anr								
Zirconium	50	.45									

(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP
QC Limits: result < RL

Date Analyzed: 05/23/13
Run ID: MA15650

Methods: SW846 6010B, SW846 6010C
Units: ug/l

Time:	
Sample ID:	
Metal	

(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB37147
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP Date Analyzed: 05/23/13 Methods: SW846 6010B, SW846 6010C
QC Limits: result < RL Run ID: MA15650 Units: ug/l

Metal	Sample ID:	Time: Sample ID:		19:36 CCB4		20:29 CCB5		21:22 CCB6		22:11 CCB7	
		RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum		200	12	anr							
Antimony		6.0	1.1	anr							
Arsenic		10	1.7	anr							
Barium		500	.32	anr							
Beryllium		4.0	.1	anr							
Boron		100	1.1	anr							
Cadmium		4.0	.25	anr							
Calcium		5000	21	anr							
Chromium		10	.48	anr							
Cobalt		50	.29	anr							
Copper		25	.93	anr							
Gold		50	1.5								
Iron		100	3.5	anr							
Lead		10	1.2	-0.10	<10	0.10	<10	1.9	<10	1.7	<10
Magnesium		5000	30	anr							
Manganese		15	.16	anr							
Molybdenum		100	.31								
Nickel		40	.45	anr							
Palladium		50	2.2								
Platinum		50	6.4								
Potassium		5000	54	anr							
Selenium		25	1.7	anr							
Silicon		100	2								
Silver		5.0	.81	anr							
Sodium		5000	16	anr							
Strontium		10	.12								
Thallium		5.0	1.2	anr							
Tin		100	.87	anr							
Titanium		50	.66	anr							
Tungsten		100	9.3								
Vanadium		10	.82	anr							
Zinc		100	.45	anr							
Zirconium		50	.45								

(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP
QC Limits: result < RL

Date Analyzed: 05/23/13
Run ID: MA15650

Methods: SW846 6010B, SW846 6010C
Units: ug/l

Time:	
Sample ID:	
Metal	

(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB37147
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP Date Analyzed: 05/23/13 Methods: SW846 6010B, SW846 6010C
QC Limits: result < RL Run ID: MA15650 Units: ug/l

Metal	Sample ID:	Time:	22:33		final
		RL	IDL	raw	
Aluminum		200	12	anr	
Antimony		6.0	1.1	anr	
Arsenic		10	1.7	anr	
Barium		500	.32	anr	
Beryllium		4.0	.1	anr	
Boron		100	1.1	anr	
Cadmium		4.0	.25	anr	
Calcium		5000	21	anr	
Chromium		10	.48	anr	
Cobalt		50	.29	anr	
Copper		25	.93	anr	
Gold		50	1.5		
Iron		100	3.5	anr	
Lead		10	1.2	1.1	<10
Magnesium		5000	30	anr	
Manganese		15	.16	anr	
Molybdenum		100	.31		
Nickel		40	.45	anr	
Palladium		50	2.2		
Platinum		50	6.4		
Potassium		5000	54	anr	
Selenium		25	1.7	anr	
Silicon		100	2		
Silver		5.0	.81	anr	
Sodium		5000	16	anr	
Strontium		10	.12		
Thallium		5.0	1.2	anr	
Tin		100	.87	anr	
Titanium		50	.66	anr	
Tungsten		100	9.3		
Vanadium		10	.82	anr	
Zinc		100	.45	anr	
Zirconium		50	.45		

(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP
QC Limits: result < RL

Date Analyzed: 05/23/13
Run ID: MA15650

Methods: SW846 6010B, SW846 6010C
Units: ug/l

Time:	
Sample ID:	
Metal	

(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB37147
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP Date Analyzed: 05/23/13 Methods: SW846 6010B, SW846 6010C
QC Limits: 90 to 110 % Recovery Run ID: MA15650 Units: ug/l

Metal	Time: Sample ID: Metal	16:43 ICV1 True		16:54 CCV1 True		17:48 CCV2 True	
		Results	% Rec	Results	% Rec	Results	% Rec
Aluminum		anr					
Antimony		anr					
Arsenic		anr					
Barium		anr					
Beryllium		anr					
Boron		anr					
Cadmium		anr					
Calcium		anr					
Chromium		anr					
Cobalt		anr					
Copper		anr					
Gold							
Iron		anr					
Lead	3000	2960	98.7	2000	1940	97.0	2000
Magnesium		anr					
Manganese		anr					
Molybdenum							
Nickel		anr					
Palladium							
Platinum							
Potassium		anr					
Selenium		anr					
Silicon							
Silver		anr					
Sodium		anr					
Strontium							
Thallium		anr					
Tin		anr					
Titanium		anr					
Tungsten							
Vanadium		anr					
Zinc		anr					
Zirconium							

(*) Outside of QC limits

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP

QC Limits: 90 to 110 % Recovery

Date Analyzed: 05/23/13

Run ID: MA15650

Methods: SW846 6010B, SW846 6010C

Units: ug/l

Time:

Sample ID:

Metal

(anr) Analyte not requested

13.1.3
13

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB37147
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP Date Analyzed: 05/23/13 Methods: SW846 6010B, SW846 6010C
QC Limits: 90 to 110 % Recovery Run ID: MA15650 Units: ug/l

Metal	Time: Sample ID: Metal	18:40 CCV True		19:32 CCV True		20:24 CCV True			
		Results	% Rec	Results	% Rec	Results	% Rec		
Aluminum		anr							
Antimony		anr							
Arsenic		anr							
Barium		anr							
Beryllium		anr							
Boron		anr							
Cadmium		anr							
Calcium		anr							
Chromium		anr							
Cobalt		anr							
Copper		anr							
Gold									
Iron		anr							
Lead	2000	1930	96.5	2000	1910	95.5	2000	1900	95.0
Magnesium		anr							
Manganese		anr							
Molybdenum									
Nickel		anr							
Palladium									
Platinum									
Potassium		anr							
Selenium		anr							
Silicon									
Silver		anr							
Sodium		anr							
Strontium									
Thallium		anr							
Tin		anr							
Titanium		anr							
Tungsten									
Vanadium		anr							
Zinc		anr							
Zirconium									

(*) Outside of QC limits

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP

QC Limits: 90 to 110 % Recovery

Date Analyzed: 05/23/13

Run ID: MA15650

Methods: SW846 6010B, SW846 6010C

Units: ug/l

Time:

Sample ID:

Metal

(anr) Analyte not requested

13.1.3
13

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB37147
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP Date Analyzed: 05/23/13 Methods: SW846 6010B, SW846 6010C
QC Limits: 90 to 110 % Recovery Run ID: MA15650 Units: ug/l

Metal	Time: Sample ID: Metal	True	21:18 CCV Results	% Rec	CCV True	22:07 CCV7 Results	% Rec	CCV True	22:29 CCV8 Results	% Rec
Aluminum		anr								
Antimony		anr								
Arsenic		anr								
Barium		anr								
Beryllium		anr								
Boron		anr								
Cadmium		anr								
Calcium		anr								
Chromium		anr								
Cobalt		anr								
Copper		anr								
Gold										
Iron		anr								
Lead	2000	1890	94.5		2000	1890	94.5	2000	1880	94.0
Magnesium		anr								
Manganese		anr								
Molybdenum										
Nickel		anr								
Palladium										
Platinum										
Potassium		anr								
Selenium		anr								
Silicon										
Silver		anr								
Sodium		anr								
Strontium										
Thallium		anr								
Tin		anr								
Titanium		anr								
Tungsten										
Vanadium		anr								
Zinc		anr								
Zirconium										

(*) Outside of QC limits

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP

QC Limits: 90 to 110 % Recovery

Date Analyzed: 05/23/13

Run ID: MA15650

Methods: SW846 6010B, SW846 6010C

Units: ug/l

Time:

Sample ID:

Metal

(anr) Analyte not requested

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP

QC Limits: CRI 70-130% CRIA 70-130%

Date Analyzed: 05/23/13

Run ID: MA15650

Methods: SW846 6010B, SW846 6010C

Units: ug/l

Metal	Time:		17:05		22:15		
	Sample ID:	CRI	CRIA	CRIA1	Results	% Rec	
Aluminum	200	200		anr			
Antimony	6.0	10		anr			
Arsenic	4.0	10		anr			
Barium	50	50		anr			
Beryllium	4.0	4.0		anr			
Boron	100	100		anr			
Cadmium	4.0	4.0		anr			
Calcium	5000	5000		anr			
Chromium	10	10		anr			
Cobalt	50	50		anr			
Copper	25	25		anr			
Gold	50	50					
Iron	100	100		anr			
Lead	5.0	10	11.4	114.0	9.7	97.0	
Magnesium	5000	5000		anr			
Manganese	15	15		anr			
Molybdenum	100	100					
Nickel	40	40		anr			
Palladium	50	50					
Platinum	50	50					
Potassium	5000	5000		anr			
Selenium	10	10		anr			
Silicon	100	100					
Silver	5.0	5.0		anr			
Sodium	5000	5000		anr			
Strontium	10	10					
Thallium	5.0	10		anr			
Tin	100	100		anr			
Titanium	50	50		anr			
Tungsten	100	100					
Vanadium	10	10		anr			
Zinc	20	20		anr			
Zirconium	50	50					

(*) Outside of QC limits

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP

Date Analyzed: 05/23/13

Methods: SW846 6010B, SW846 6010C

QC Limits: CRI 70-130% CRIA 70-130%

Run ID: MA15650

Units: ug/l

Time:

Sample ID:

Metal

(anr) Analyte not requested

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP Date Analyzed: 05/23/13 Methods: SW846 6010B, SW846 6010C
QC Limits: 80 to 120 % Recovery Run ID: MA15650 Units: ug/l

Metal	Sample ID: True	Time: ICSA True	17:09 ICSA1		17:14 ICSAB1		22:20 ICSA2		22:24 ICSAB2	
			Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	518000	103.6	508000	101.6	493000	98.6	497000	99.4
Antimony	2000	-1.0			2080	104.0	-1.4		2010	100.5
Arsenic	2000	-1.3			2070	103.5	-1.8		2010	100.5
Barium	500	-0.20			504	100.8	-0.20		483	96.6
Beryllium	500	0.10			471	94.2	0.0		451	90.2
Boron	1000	7.3			1060	106.0	6.9		1020	102.0
Cadmium	1000	-0.30			1050	105.0	-0.40		1010	101.0
Calcium	500000	500000	461000	92.2	463000	92.6	444000	88.8	443000	88.6
Chromium	500	0.70			513	102.6	0.50		456	91.2
Cobalt	500	3.3			504	100.8	3.0		488	97.6
Copper	500	1.1			539	107.8	1.2		475	95.0
Gold	500	8.9			530	106.0	9.0		468	93.6
Iron	200000	200000	185000	92.5	185000	92.5	181000	90.5	184000	92.0
Lead	1000	-2.6			952	95.2	-4.8		920	92.0
Magnesium	500000	500000	492000	98.4	492000	98.4	466000	93.2	462000	92.4
Manganese	500	0.30			513	102.6	0.30		452	90.4
Molybdenum	1000	-0.80			990	99.0	-0.40		966	96.6
Nickel	1000	-4.2			922	92.2	-4.8		878	87.8
Palladium	500	-22			528	105.6	-24		489	97.8
Platinum	500	-27			508	101.6	-22		461	92.2
Potassium		-70			14.1		-98		-100	
Selenium	2000	-1.8			1970	98.5	0.10		1910	95.5
Silicon	2000	41.5			2230	111.5	42.4		2190	109.5
Silver	1000	0.10			1120	112.0	0.10		987	98.7
Sodium		106			128		-43		-18	
Strontium	1000	1.2			986	98.6	1.1		958	95.8
Thallium	2000	-2.1			2010	100.5	-5.0		1940	97.0
Tin	1000	0.80			1030	103.0	1.4		1000	100.0
Titanium	500	8.0			541	108.2	8.2		484	96.8
Tungsten	2000	-44			1920	96.0	-38		1690	84.5
Vanadium	500	0.90			527	105.4	0.50		469	93.8
Zinc	1000	-0.70			928	92.8	-0.80		892	89.2
Zirconium	500	-0.30			508	101.6	-0.30		448	89.6

(*) Outside of QC limits

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052313M2.ICP

QC Limits: 80 to 120 % Recovery

Date Analyzed: 05/23/13

Run ID: MA15650

Methods: SW846 6010B, SW846 6010C

Units: ug/l

Time:

Sample ID:

Metal

(anr) Analyte not requested

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052413M1.ICP
Analyst: EAL
Parameters: Pb

Date Analyzed: 05/24/13

Run ID: MA15657

Methods: SW846 6010B, SW846 6010C

Time	Sample Description	Dilution Factor	PS Recov	Comments
08:35	MA15657-STD1	1		STD1
08:39	MA15657-STD2	1		STD2
08:44	MA15657-STD3	1		STD3
08:48	MA15657-STD4	1		STD4
08:52	MA15657-ICV1	1		
08:59	MA15657-ICB1	1		
09:03	MA15657-CCV1	1		
09:11	MA15657-CCB1	1		
09:15	MA15657-CRIA1	1		
09:20	MA15657-ICSA1	1		
09:24	MA15657-ICSAB1	1		
09:29	MP21035-B1	1		
09:33	MP21035-B2	1		
09:37	MP21035-MB1	1		
09:42	MP21035-MB2	1		
09:46	MC20922-3	1		(sample used for QC only; not part of login JB37147)
09:50	MP21035-SD1	5		
09:55	ZZZZZZ	1		DNR: FOR INTERNAL QC USE ONLY.
09:59	MA15657-CCV2	1		
10:10	MA15657-CCB2	1		
10:14	ZZZZZZ	1		
10:18	ZZZZZZ	1		
10:23	ZZZZZZ	1		
10:27	ZZZZZZ	1		
10:31	ZZZZZZ	1		
10:36	ZZZZZZ	1		
10:40	ZZZZZZ	1		
10:44	ZZZZZZ	1		
10:49	ZZZZZZ	1		
10:53	ZZZZZZ	1		
10:57	MA15657-CCV3	1		
11:01	MA15657-CCB3	1		
11:06	ZZZZZZ	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052413M1.ICP

Date Analyzed: 05/24/13

Methods: SW846 6010B, SW846 6010C

Analyst: EAL

Run ID: MA15657

Parameters: Pb

Time	Sample Description	Dilution Factor	PS Recov	Comments
11:10	ZZZZZZ	1		
11:15	ZZZZZZ	1		
11:19	ZZZZZZ	1		
11:23	ZZZZZZ	1		
11:28	ZZZZZZ	1		
11:32	ZZZZZZ	1		
11:36	ZZZZZZ	1		
11:41	ZZZZZZ	1		
11:45	MP21036-B1	1		
11:49	MA15657-CCV4	1		
11:53	MA15657-CCB4	1		
11:58	MP21036-B2	1		
12:02	MP21036-MB1	1		
12:06	MP21036-MB2	1		
12:11	MC20922-29	1		(sample used for QC only; not part of login JB37147)
12:15	MP21036-SD1	5		
12:19	ZZZZZZ	1		DNR: FOR INTERNAL QC USE ONLY.
12:24	ZZZZZZ	1		
12:28	ZZZZZZ	1		
12:32	ZZZZZZ	1		
12:37	ZZZZZZ	1		
12:41	MA15657-CCV5	1		
12:45	MA15657-CCB5	1		
12:50	ZZZZZZ	1		
12:54	ZZZZZZ	1		
12:58	ZZZZZZ	1		
13:03	ZZZZZZ	1		
13:07	ZZZZZZ	1		
13:12	ZZZZZZ	1		
13:16	ZZZZZZ	1		
13:20	ZZZZZZ	1		
13:25	ZZZZZZ	1		
13:29	ZZZZZZ	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052413M1.ICP

Date Analyzed: 05/24/13

Methods: SW846 6010B, SW846 6010C

Analyst: EAL

Run ID: MA15657

Parameters: Pb

Time	Sample Description	Dilution Factor	PS Recov	Comments
13:33	MA15657-CCV6	1		
13:37	MA15657-CCB6	1		
13:42	ZZZZZZ	1		
13:46	ZZZZZZ	1		
13:51	ZZZZZZ	1		
13:55	ZZZZZZ	1		
13:59	ZZZZZZ	1		
14:04	ZZZZZZ	10		
14:20	ZZZZZZ	2		
14:24	ZZZZZZ	10		
14:28	ZZZZZZ	5		
14:33	MP21026-PS1	1		
14:37	MA15657-CCV7	1		
14:41	MA15657-CCB7	1		
14:46	JB37147-2	10		
-----> Last reportable sample/prep for job JB37147				
14:50	ZZZZZZ	5		
14:54	ZZZZZZ	5		
14:59	ZZZZZZ	5		
15:03	ZZZZZZ	5		
15:08	ZZZZZZ	5		
15:12	MA15657-CRIA2	1		
15:16	MA15657-ICSA2	1		
15:21	MA15657-ICSAB2	1		
15:28	MA15657-CCV8	1		
15:37	MA15657-CCB8	1		
-----> Last reportable CCB for job JB37147				
15:42	MP21037-B1	1		
15:46	MP21037-B2	1		
15:50	MP21037-MB1	1		
15:54	MP21037-MB2	1		
15:59	MC20922-37	1		(sample used for QC only; not part of login JB37147)
16:03	MP21037-SD1	5		
16:08	ZZZZZZ	1		DNR: FOR INTERNAL QC USE ONLY.
16:12	ZZZZZZ	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052413M1.ICP

Date Analyzed: 05/24/13

Methods: SW846 6010B, SW846 6010C

Analyst: EAL

Run ID: MA15657

Parameters: Pb

Time	Sample Description	Dilution Factor	PS Recov	Comments
16:16	ZZZZZZ	1		
16:21	ZZZZZZ	1		
16:25	MA15657-CCV9	1		
16:29	MA15657-CCB9	1		
16:33	ZZZZZZ	1		
16:38	ZZZZZZ	1		
16:42	ZZZZZZ	1		
16:47	ZZZZZZ	1		
16:51	ZZZZZZ	1		
16:55	ZZZZZZ	1		
17:00	ZZZZZZ	1		
17:04	ZZZZZZ	1		
17:08	ZZZZZZ	1		
17:13	ZZZZZZ	1		
17:17	MA15657-CCV10	1		
17:21	MA15657-CCB10	1		
17:25	ZZZZZZ	1		
17:30	ZZZZZZ	1		
17:34	ZZZZZZ	1		
17:39	ZZZZZZ	1		
17:43	ZZZZZZ	1		
17:47	ZZZZZZ	1		
17:52	MA15657-CRIA3	1		
17:56	MA15657-ICSA3	1		
18:01	MA15657-ICSAB3	1		
18:10	ZZZZZZ	1		DNR: SEE RERUN FOR CCV.
18:18	MA15657-CCV11	1		
18:31	MA15657-CCB11	1		

Refer to raw data for calibration curve and standards.

INTERNAL STANDARD SUMMARY

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052413M1.ICP

Date Analyzed: 05/24/13

Methods: SW846 6010B, SW846 6010C

Analyst: EAL

Run ID: MA15657

Parameters: Pb

Time	Sample Description	Istd#1	Istd#2	Istd#3
08:35	MA15657-STD1	1750 R	77488 R	17545 R
08:39	MA15657-STD2	1773	77326	16317
08:44	MA15657-STD3			16304
08:48	MA15657-STD4	1761	76335	16444
08:52	MA15657-ICV1	1733	75931	16490
08:59	MA15657-ICB1	1742	75321	16394
09:03	MA15657-CCV1	1753	77740	17008
09:11	MA15657-CCB1	1738	77042	16751
09:15	MA15657-CRIA1	1725	76773	16765
09:20	MA15657-ICSA1	1577	71567	16140
09:24	MA15657-ICSAB1	1589	71189	16180
09:29	MP21035-B1	1712.2	74201	16282
09:33	MP21035-B2	1739.4	75517	16608
09:37	MP21035-MB1	1744.6	74297	16513
09:42	MP21035-MB2	1784.4	76046	16688
09:46	MC20922-3	1759.4	75531	16864
09:50	MP21035-SD1	1761.9	74589	16381
09:55	ZZZZZZ	1889	82397	18055
09:59	MA15657-CCV2	1749	75443	16566
10:10	MA15657-CCB2	1753	74707	16223
10:14	ZZZZZZ	1753.9	75427	16733
10:18	ZZZZZZ	1748.9	74329	16877
10:23	ZZZZZZ	1750.2	74617	16508
10:27	ZZZZZZ	1746.3	75733	16877
10:31	ZZZZZZ	1748.3	74504	16541
10:36	ZZZZZZ	1758.4	74796	16800
10:40	ZZZZZZ	1758	74216	16441
10:44	ZZZZZZ	1755.2	74431	16648
10:49	ZZZZZZ	1746.8	74165	16561
10:53	ZZZZZZ	1751.9	75183	16794
10:57	MA15657-CCV3	1745	74598	16454
11:01	MA15657-CCB3	1756	73999	16242
11:06	ZZZZZZ	1730.5	74218	16529

INTERNAL STANDARD SUMMARY

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052413M1.ICP

Date Analyzed: 05/24/13

Methods: SW846 6010B, SW846 6010C

Analyst: EAL

Run ID: MA15657

Parameters: Pb

Time	Sample Description	Istd#1	Istd#2	Istd#3
11:10	ZZZZZZ	1734.7	73545	16458
11:15	ZZZZZZ	1729.8	73618	16359
11:19	ZZZZZZ	1727.5	73836	16313
11:23	ZZZZZZ	1728.6	73760	16367
11:28	ZZZZZZ	1740.9	73511	16437
11:32	ZZZZZZ	1741.3	73378	16501
11:36	ZZZZZZ	1735.9	73574	16492
11:41	ZZZZZZ	1726.5	73031	16527
11:45	MP21036-B1	1698.5	71876	16272
11:49	MA15657-CCV4	1734	73929	16372
11:53	MA15657-CCB4	1737	73296	16262
11:58	MP21036-B2	1699.4	72352	16093
12:02	MP21036-MB1	1714.5	72616	16474
12:06	MP21036-MB2	1731.7	73259	16315
12:11	MC20922-29	1693.2	71932	16077
12:15	MP21036-SD1	1721.6	73090	16175
12:19	ZZZZZZ	1819	78828	17540
12:24	ZZZZZZ	1698	72351	15976
12:28	ZZZZZZ	1699	72176	16198
12:32	ZZZZZZ	1705.4	71423	16179
12:37	ZZZZZZ	1692.3	71471	16007
12:41	MA15657-CCV5	1717	73124	16183
12:45	MA15657-CCB5	1721	72182	15960
12:50	ZZZZZZ	1699.4	71848	16257
12:54	ZZZZZZ	1702.8	71906	16023
12:58	ZZZZZZ	1684.5	71332	15934
13:03	ZZZZZZ	1692.8	71830	16071
13:07	ZZZZZZ	1692.2	71536	15975
13:12	ZZZZZZ	1698.8	71828	16129
13:16	ZZZZZZ	1683.9	71449	16141
13:20	ZZZZZZ	1701.2	71690	15969
13:25	ZZZZZZ	1693.2	72198	16019
13:29	ZZZZZZ	1677.8	71517	15891

13.2.1

13

INTERNAL STANDARD SUMMARY

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052413M1.ICP

Date Analyzed: 05/24/13

Methods: SW846 6010B, SW846 6010C

Analyst: EAL

Run ID: MA15657

Parameters: Pb

Time	Sample Description	Istd#1	Istd#2	Istd#3
13:33	MA15657-CCV6	1697	72373	15973
13:37	MA15657-CCB6	1714	71920	16045
13:42	ZZZZZZ	1687	72364	16237
13:46	ZZZZZZ	1687	70801	15923
13:51	ZZZZZZ	1688.7	71674	16144
13:55	ZZZZZZ	1678.3	71310	15977
13:59	ZZZZZZ	1685.6	71240	15981
14:04	ZZZZZZ	1718	73324	16212
14:20	ZZZZZZ	2013	86895	18892
14:24	ZZZZZZ	1708	72459	16057
14:28	ZZZZZZ	1687	72341	16327
14:33	MP21026-PS1	1915	83023	18420
14:37	MA15657-CCV7	1684	72462	15796
14:41	MA15657-CCB7	1701	71930	15900
14:46	JB37147-2	1633	70948	16160
14:50	ZZZZZZ	1672	72896	15998
14:54	ZZZZZZ	1660	72184	16044
14:59	ZZZZZZ	1675	71980	16023
15:03	ZZZZZZ	1653	71167	15964
15:08	ZZZZZZ	1661	71461	15970
15:12	MA15657-CRIA2	1688	71280	15587
15:16	MA15657-ICSA2	1535	66412	15509
15:21	MA15657-ICSAB2	1516	65995	15191
15:28	MA15657-CCV8	1670	71601	15706
15:37	MA15657-CCB8	1681	70944	15710
15:42	MP21037-B1	1631.5	69615	15800
15:46	MP21037-B2	1647.3	70649	15676
15:50	MP21037-MB1	1669.9	70809	15864
15:54	MP21037-MB2	1677.3	71423	15816
15:59	MC20922-37	1660.6	70536	15949
16:03	MP21037-SD1	1666.5	70404	15926
16:08	ZZZZZZ	1777	77194	17093
16:12	ZZZZZZ	1638.6	70184	15799

13.2.1

13

INTERNAL STANDARD SUMMARY

Login Number: JB37147
 Account: ALNJ - Accutest New Jersey
 Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052413M1.ICP Date Analyzed: 05/24/13 Methods: SW846 6010B, SW846 6010C
 Analyst: EAL Run ID: MA15657
 Parameters: Pb

Time	Sample Description	Istd#1	Istd#2	Istd#3
16:16	ZZZZZZ	1650.2	70846	15742
16:21	ZZZZZZ	1656.1	70999	16015
16:25	MA15657-CCV9	1661	71551	15849
16:29	MA15657-CCB9	1670	70717	15816
16:33	ZZZZZZ	1661.8	71330	15888
16:38	ZZZZZZ	1656.8	71035	15951
16:42	ZZZZZZ	1652	71301	15930
16:47	ZZZZZZ	1658.4	71474	15955
16:51	ZZZZZZ	1654.3	71103	16094
16:55	ZZZZZZ	1649.8	71078	16047
17:00	ZZZZZZ	1653.7	71470	16137
17:04	ZZZZZZ	1648	71125	16003
17:08	ZZZZZZ	1646.9	71071	15962
17:13	ZZZZZZ	1662	71891	16188
17:17	MA15657-CCV10	1659	72014	16105
17:21	MA15657-CCB10	1658	71302	15848
17:25	ZZZZZZ	1628.5	71706	16118
17:30	ZZZZZZ	1631	71066	16078
17:34	ZZZZZZ	1632.1	71067	15983
17:39	ZZZZZZ	1640.9	71682	15915
17:43	ZZZZZZ	1635.9	71013	15830
17:47	ZZZZZZ	1639.2	71027	15699
17:52	MA15657-CRIA3	1655	71362	15478
17:56	MA15657-ICSA3	1500	66016	15274
18:01	MA15657-ICSAB3	1494	65923	14939
18:10	ZZZZZZ	1626	69965	15152
18:18	MA15657-CCV11	1621	69746	15007
18:31	MA15657-CCB11	1611	68134	14754

R = Reference for ISTD limits. ! = Outside limits.

LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %

13.2.1

13

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB37147
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052413M1.ICP Date Analyzed: 05/24/13 Methods: SW846 6010B, SW846 6010C
QC Limits: result < RL Run ID: MA15657 Units: ug/l

Metal	Time: Sample ID: RL	IDL	08:59 ICB1		09:11 CCB1		10:10 CCB2		11:01 CCB3		final
			raw	final	raw	final	raw	final	raw	final	
Aluminum	200	12	anr								
Antimony	10	1.1	anr								
Arsenic	10	1.7	anr								
Barium	50	.32	anr								
Beryllium	4.0	.1	anr								
Boron	100	1.1									
Cadmium	4.0	.25	anr								
Calcium	5000	21	anr								
Chromium	10	.48	anr								
Cobalt	50	.29	anr								
Copper	25	.93	anr								
Gold	50	1.5									
Iron	100	3.5	anr								
Lead	10	1.2	1.0	<10	0.90	<10	0.40	<10	0.40	<10	
Magnesium	5000	30	anr								
Manganese	15	.16	anr								
Molybdenum	100	.31									
Nickel	40	.45	anr								
Palladium	50	2.2									
Platinum	50	6.4									
Potassium	5000	54	anr								
Selenium	10	1.7	anr								
Silicon	100	2									
Silver	5.0	.81	anr								
Sodium	5000	16	anr								
Strontium	10	.12									
Thallium	10	1.2	anr								
Tin	100	.87									
Titanium	50	.66									
Tungsten	100	9.3									
Vanadium	10	.82	anr								
Zinc	20	.45	anr								
Zirconium	50	.45									

(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052413M1.ICP
QC Limits: result < RL

Date Analyzed: 05/24/13
Run ID: MA15657

Methods: SW846 6010B, SW846 6010C
Units: ug/l

Time:	
Sample ID:	
Metal	

(anr) Analyte not requested

13.2.2

13

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB37147
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052413M1.ICP Date Analyzed: 05/24/13 Methods: SW846 6010B, SW846 6010C
QC Limits: result < RL Run ID: MA15657 Units: ug/l

Metal	Time: Sample ID: RL	IDL	11:53 CCB4		12:45 CCB5		13:37 CCB6		14:41 CCB7		final
			raw	final	raw	final	raw	final	raw	final	
Aluminum	200	12	anr								
Antimony	10	1.1	anr								
Arsenic	10	1.7	anr								
Barium	50	.32	anr								
Beryllium	4.0	.1	anr								
Boron	100	1.1									
Cadmium	4.0	.25	anr								
Calcium	5000	21	anr								
Chromium	10	.48	anr								
Cobalt	50	.29	anr								
Copper	25	.93	anr								
Gold	50	1.5									
Iron	100	3.5	anr								
Lead	10	1.2	0.40	<10	0.10	<10	0.20	<10	0.50	<10	
Magnesium	5000	30	anr								
Manganese	15	.16	anr								
Molybdenum	100	.31									
Nickel	40	.45	anr								
Palladium	50	2.2									
Platinum	50	6.4									
Potassium	5000	54	anr								
Selenium	10	1.7	anr								
Silicon	100	2									
Silver	5.0	.81	anr								
Sodium	5000	16	anr								
Strontium	10	.12									
Thallium	10	1.2	anr								
Tin	100	.87									
Titanium	50	.66									
Tungsten	100	9.3									
Vanadium	10	.82	anr								
Zinc	20	.45	anr								
Zirconium	50	.45									

(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052413M1.ICP
QC Limits: result < RL

Date Analyzed: 05/24/13
Run ID: MA15657

Methods: SW846 6010B, SW846 6010C
Units: ug/l

Time:	
Sample ID:	
Metal	

(anr) Analyte not requested

13.2.2

13

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB37147
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052413M1.ICP Date Analyzed: 05/24/13 Methods: SW846 6010B, SW846 6010C
QC Limits: result < RL Run ID: MA15657 Units: ug/l

Metal	Sample ID: Time: RL	15:37 CCB8		final
		IDL	raw	
Aluminum	200	12	anr	
Antimony	10	1.1	anr	
Arsenic	10	1.7	anr	
Barium	50	.32	anr	
Beryllium	4.0	.1	anr	
Boron	100	1.1		
Cadmium	4.0	.25	anr	
Calcium	5000	21	anr	
Chromium	10	.48	anr	
Cobalt	50	.29	anr	
Copper	25	.93	anr	
Gold	50	1.5		
Iron	100	3.5	anr	
Lead	10	1.2	-0.10	<10
Magnesium	5000	30	anr	
Manganese	15	.16	anr	
Molybdenum	100	.31		
Nickel	40	.45	anr	
Palladium	50	2.2		
Platinum	50	6.4		
Potassium	5000	54	anr	
Selenium	10	1.7	anr	
Silicon	100	2		
Silver	5.0	.81	anr	
Sodium	5000	16	anr	
Strontium	10	.12		
Thallium	10	1.2	anr	
Tin	100	.87		
Titanium	50	.66		
Tungsten	100	9.3		
Vanadium	10	.82	anr	
Zinc	20	.45	anr	
Zirconium	50	.45		

(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052413M1.ICP
QC Limits: result < RL

Date Analyzed: 05/24/13
Run ID: MA15657

Methods: SW846 6010B, SW846 6010C
Units: ug/l

Time:	
Sample ID:	
Metal	

(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB37147
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052413M1.ICP Date Analyzed: 05/24/13 Methods: SW846 6010B, SW846 6010C
QC Limits: 90 to 110 % Recovery Run ID: MA15657 Units: ug/l

Metal	Time: Sample ID: True	08:52 ICV1 Results		09:03 CCV1 Results		09:59 CCV2 Results	
		CCV	% Rec	CCV	% Rec	CCV	% Rec
Aluminum	anr						
Antimony	anr						
Arsenic	anr						
Barium	anr						
Beryllium	anr						
Boron							
Cadmium	anr						
Calcium	anr						
Chromium	anr						
Cobalt	anr						
Copper	anr						
Gold							
Iron	anr						
Lead	3000	2990	99.7	2000	1960	98.0	2000
Magnesium	anr						
Manganese	anr						
Molybdenum							
Nickel	anr						
Palladium							
Platinum							
Potassium	anr						
Selenium	anr						
Silicon							
Silver	anr						
Sodium	anr						
Strontium							
Thallium	anr						
Tin							
Titanium							
Tungsten							
Vanadium	anr						
Zinc	anr						
Zirconium							

(*) Outside of QC limits

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052413M1.ICP

QC Limits: 90 to 110 % Recovery

Date Analyzed: 05/24/13

Run ID: MA15657

Methods: SW846 6010B, SW846 6010C

Units: ug/l

Time:

Sample ID:

Metal

(anr) Analyte not requested

13.2.3

13

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB37147
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052413M1.ICP Date Analyzed: 05/24/13 Methods: SW846 6010B, SW846 6010C
QC Limits: 90 to 110 % Recovery Run ID: MA15657 Units: ug/l

Metal	Time: Sample ID: True	10:57 CCV Results		11:49 CCV Results		12:41 CCV True			
		CCV3	% Rec	CCV4	% Rec	CCV5	% Rec		
Aluminum	anr								
Antimony	anr								
Arsenic	anr								
Barium	anr								
Beryllium	anr								
Boron									
Cadmium	anr								
Calcium	anr								
Chromium	anr								
Cobalt	anr								
Copper	anr								
Gold									
Iron	anr								
Lead	2000	1930	96.5	2000	1960	98.0	2000	1990	99.5
Magnesium	anr								
Manganese	anr								
Molybdenum									
Nickel	anr								
Palladium									
Platinum									
Potassium	anr								
Selenium	anr								
Silicon									
Silver	anr								
Sodium	anr								
Strontium									
Thallium	anr								
Tin									
Titanium									
Tungsten									
Vanadium	anr								
Zinc	anr								
Zirconium									

(*) Outside of QC limits

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052413M1.ICP

QC Limits: 90 to 110 % Recovery

Date Analyzed: 05/24/13

Run ID: MA15657

Methods: SW846 6010B, SW846 6010C

Units: ug/l

Time:

Sample ID:

Metal

(anr) Analyte not requested

13.2.3

13

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB37147
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052413M1.ICP Date Analyzed: 05/24/13 Methods: SW846 6010B, SW846 6010C
QC Limits: 90 to 110 % Recovery Run ID: MA15657 Units: ug/l

Metal	Time: Sample ID: True	13:33 CCV Results		14:37 CCV Results		15:28 CCV Results	
		% Rec	True	% Rec	True	% Rec	True
Aluminum	anr						
Antimony	anr						
Arsenic	anr						
Barium	anr						
Beryllium	anr						
Boron							
Cadmium	anr						
Calcium	anr						
Chromium	anr						
Cobalt	anr						
Copper	anr						
Gold							
Iron	anr						
Lead	2000	2010	100.5	2000	2020	101.0	2000
Magnesium	anr						
Manganese	anr						
Molybdenum							
Nickel	anr						
Palladium							
Platinum							
Potassium	anr						
Selenium	anr						
Silicon							
Silver	anr						
Sodium	anr						
Strontium							
Thallium	anr						
Tin							
Titanium							
Tungsten							
Vanadium	anr						
Zinc	anr						
Zirconium							

(*) Outside of QC limits

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052413M1.ICP

QC Limits: 90 to 110 % Recovery

Date Analyzed: 05/24/13

Run ID: MA15657

Methods: SW846 6010B, SW846 6010C

Units: ug/l

Time:

Sample ID:

Metal

(anr) Analyte not requested

13.2.3

13

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JB37147
 Account: ALNJ - Accutest New Jersey
 Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052413M1.ICP Date Analyzed: 05/24/13 Methods: SW846 6010B, SW846 6010C
 QC Limits: CRI 70-130% CRIA 70-130% Run ID: MA15657 Units: ug/l

Metal	Time:		09:15		15:12				
	Sample ID:	CRI	CRIA	CRIAl	Results	% Rec	CRIA2	Results	% Rec
Aluminum	200	200		anr					
Antimony	6.0	10		anr					
Arsenic	4.0	10		anr					
Barium	50	50		anr					
Beryllium	4.0	4.0		anr					
Boron	100	100							
Cadmium	4.0	4.0		anr					
Calcium	5000	5000		anr					
Chromium	10	10		anr					
Cobalt	50	50		anr					
Copper	25	25		anr					
Gold	50	50							
Iron	100	100		anr					
Lead	5.0	10	10.4	104.0	11.8	118.0			
Magnesium	5000	5000		anr					
Manganese	15	15		anr					
Molybdenum	100	100							
Nickel	40	40		anr					
Palladium	50	50							
Platinum	50	50							
Potassium	5000	5000		anr					
Selenium	10	10		anr					
Silicon	100	100							
Silver	5.0	5.0		anr					
Sodium	5000	5000		anr					
Strontium	10	10							
Thallium	5.0	10		anr					
Tin	100	100							
Titanium	50	50							
Tungsten	100	100							
Vanadium	10	10		anr					
Zinc	20	20		anr					
Zirconium	50	50							

(*) Outside of QC limits

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052413M1.ICP

Date Analyzed: 05/24/13

Methods: SW846 6010B, SW846 6010C

QC Limits: CRI 70-130% CRIA 70-130%

Run ID: MA15657

Units: ug/l

Time:

Sample ID:

Metal

(anr) Analyte not requested

13.2.4
13

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: JB37147
 Account: ALNJ - Accutest New Jersey
 Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052413M1.ICP Date Analyzed: 05/24/13 Methods: SW846 6010B, SW846 6010C
 QC Limits: 80 to 120 % Recovery Run ID: MA15657 Units: ug/l

Metal	Time:		09:20		09:24		15:16		15:21			
	Sample ID:	ICSA	ICSA	ICSAB	ICSA1 Results	% Rec	ICSA1 Results	% Rec	ICSA2 Results	% Rec	ICSA2 Results	% Rec
Aluminum	500000	500000	519000	103.8	521000	104.2	549000	109.8	553000	110.6		
Antimony		2000	0.50		2120	106.0	1.7		2230	111.5		
Arsenic		2000	-4.2		2070	103.5	-2.5		2200	110.0		
Barium		500	-0.10		499	99.8	0.20		530	106.0		
Beryllium		500	0.10		471	94.2	0.0		515	103.0		
Boron		1000	6.8		1090	109.0	7.3		1160	116.0		
Cadmium		1000	0.0		1070	107.0	-0.30		1140	114.0		
Calcium	500000	500000	455000	91.0	451000	90.2	477000	95.4	487000	97.4		
Chromium		500	-0.80		462	92.4	-0.70		500	100.0		
Cobalt		500	1.4		497	99.4	0.60		514	102.8		
Copper		500	2.7		504	100.8	2.8		554	110.8		
Gold		500	6.1		483	96.6	11.8		526	105.2		
Iron	200000	200000	184000	92.0	182000	91.0	191000	95.5	192000	96.0		
Lead		1000	-3.0		945	94.5	-2.5		1000	100.0		
Magnesium	500000	500000	482000	96.4	485000	97.0	522000	104.4	523000	104.6		
Manganese		500	0.30		468	93.6	0.70		523	104.6		
Molybdenum		1000	-0.50		998	99.8	-0.70		1060	106.0		
Nickel		1000	-1.3		909	90.9	-0.90		950	95.0		
Palladium		500	-32		494	98.8	-37		560	112.0		
Platinum		500	-19		461	92.2	-29		497	99.4		
Potassium			-17		-8.9		-30		-59			
Selenium		2000	-2.2		1980	99.0	-2.4		2100	105.0		
Silicon		2000	41.4		2210	110.5	45.7		2320	116.0		
Silver		1000	1.5		1030	103.0	1.4		1120	112.0		
Sodium			69.4		63.8		57.2		42.9			
Strontium		1000	1.0		985	98.5	1.4		1050	105.0		
Thallium		2000	-5.5		2020	101.0	-8.2		2150	107.5		
Tin		1000	0.30		1010	101.0	1.2		1090	109.0		
Titanium		500	7.8		495	99.0	8.2		533	106.6		
Tungsten		2000	-38		1770	88.5	-48		1940	97.0		
Vanadium		500	-0.30		483	96.6	0.40		528	105.6		
Zinc		1000	-1.2		897	89.7	-1.0		953	95.3		
Zirconium		500	-0.10		468	93.6	-0.10		502	100.4		

(*) Outside of QC limits

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SB052413M1.ICP

QC Limits: 80 to 120 % Recovery

Date Analyzed: 05/24/13

Run ID: MA15657

Methods: SW846 6010B, SW846 6010C

Units: ug/l

Time:

Sample ID:

Metal

(anr) Analyte not requested

13.2.5
13

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: JB37147
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21026
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:

05/22/13

Metal	RL	IDL	MDL	MB raw	final
Aluminum	20	1.2	3.6		
Antimony	1.0	.11	.15		
Arsenic	1.0	.17	.21		
Barium	5.0	.032	.073		
Beryllium	0.40	.01	.024		
Boron	10	.11	.11		
Cadmium	0.40	.025	.042		
Calcium	500	2.1	6.3		
Chromium	1.0	.048	.095		
Cobalt	5.0	.029	.047		
Copper	2.5	.093	.56		
Gold	5.0	.15	.43		
Iron	10	.35	.87		
Lead	1.0	.12	.17	0.010	<1.0
Magnesium	500	3	5.1		
Manganese	1.5	.016	.04		
Molybdenum	10	.031	.07		
Nickel	4.0	.045	.044		
Palladium	5.0	.22	.64		
Platinum	5.0	.64	1.5		
Potassium	500	5.4	8.6		
Selenium	1.0	.17	.35		
Silicon	10	.2	3.3		
Silver	0.50	.081	.13		
Sodium	500	1.6	3.3		
Strontium	1.0	.012	.03		
Thallium	1.0	.12	.13		
Tin	10	.087	.14		
Titanium	5.0	.066	.14		
Tungsten	10	.93	.94		
Vanadium	1.0	.082	.13		
Zinc	2.0	.045	.16		
Zirconium	5.0	.045	.088		

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: JB37147
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21026
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:

Metal

Associated samples MP21026: JB37147-1, JB37147-2, JB37147-3, JB37147-4

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JB37147
 Account: ALNJ - Accutest New Jersey
 Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21026
 Matrix Type: SOLID

Methods: SW846 6010C
 Units: mg/kg

Prep Date: 05/22/13

Metal	MC21006-6 Original MS	Spikelot MPICP	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	anr			
Beryllium	anr			
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Gold				
Iron	anr			
Lead	16.5	98.1	99.1	82.3 75-125
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Palladium				
Platinum				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			
Zinc	anr			
Zirconium				

13.3.2

13

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21026
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:

Metal

Associated samples MP21026: JB37147-1, JB37147-2, JB37147-3, JB37147-4

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

13.3.2
13

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JB37147
 Account: ALNJ - Accutest New Jersey
 Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21026
 Matrix Type: SOLID

Methods: SW846 6010C
 Units: mg/kg

Prep Date: 05/22/13

Metal	MC21006-6 Original MSD	Spikelot MPICP	MSD % Rec	MSD RPD	QC Limit
Aluminum	anr				
Antimony	anr				
Arsenic	anr				
Barium	anr				
Beryllium	anr				
Boron					
Cadmium	anr				
Calcium	anr				
Chromium	anr				
Cobalt	anr				
Copper	anr				
Gold					
Iron	anr				
Lead	16.5	95.2	99.1	79.4	3.0
Magnesium	anr				
Manganese	anr				
Molybdenum					
Nickel	anr				
Palladium					
Platinum					
Potassium	anr				
Selenium	anr				
Silicon					
Silver	anr				
Sodium	anr				
Strontium					
Thallium	anr				
Tin					
Titanium					
Tungsten					
Vanadium	anr				
Zinc	anr				
Zirconium					

13.3.2
13

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21026
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:

Metal

Associated samples MP21026: JB37147-1, JB37147-2, JB37147-3, JB37147-4

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JB37147
 Account: ALNJ - Accutest New Jersey
 Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21026
 Matrix Type: SOLID

Methods: SW846 6010C
 Units: mg/kg

Prep Date: 05/22/13 Analyzed Date: 05/22/13

Metal	BSP Result	Spikelot MPICP	% Rec	QC Limits	LCS Result	Spikelot MPLCS79	% Rec	QC Limits
Aluminum	anr							
Antimony	anr							
Arsenic	anr							
Barium	anr							
Beryllium	anr							
Boron								
Cadmium	anr							
Calcium	anr							
Chromium	anr							
Cobalt	anr							
Copper	anr							
Gold								
Iron	anr							
Lead	94.8	100	94.8	80-120	126	136	92.6	84-117
Magnesium	anr							
Manganese	anr							
Molybdenum								
Nickel	anr							
Palladium								
Platinum								
Potassium	anr							
Selenium	anr							
Silicon								
Silver	anr							
Sodium	anr							
Strontium								
Thallium	anr							
Tin								
Titanium								
Tungsten								
Vanadium	anr							
Zinc	anr							
Zirconium								

13.3.3

13

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21026
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:

Metal

Associated samples MP21026: JB37147-1, JB37147-2, JB37147-3, JB37147-4

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

13.3.3

13

SERIAL DILUTION RESULTS SUMMARY

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21026
Matrix Type: SOLIDMethods: SW846 6010C
Units: ug/l

Prep Date: 05/22/13

Metal	MC21006-6 Original	SDL 1:5	%DIF	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	anr			
Beryllium	anr			
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Gold				
Iron	anr			
Lead	167	189	13.0 (a)	0-10
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Palladium				
Platinum				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	anr			
Zinc	anr			
Zirconium				

13.3.4
13

SERIAL DILUTION RESULTS SUMMARY

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21026
Matrix Type: SOLID

Methods: SW846 6010C
Units: ug/l

Prep Date:

Metal

Associated samples MP21026: JB37147-1, JB37147-2, JB37147-3, JB37147-4

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(anr) Analyte not requested

(a) Serial dilution indicates possible matrix interference.

POST DIGESTATE SPIKE SUMMARY

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21026
Matrix Type: SOLIDMethods: SW846 6010C
Units: ug/l

Prep Date:

05/22/13

Metal	Sample ml	Final ml	MC21006-6 Raw	PS Corr.**	Spike ug/l	Spike ml	Spike ug/ml	Spike ug/l	% Rec	QC Limits
-------	--------------	-------------	------------------	---------------	---------------	-------------	----------------	---------------	-------	--------------

Aluminum

Antimony

Arsenic

Barium

Beryllium

Boron

Cadmium

Calcium

Chromium

Cobalt

Copper

Gold

Iron

Lead

Magnesium

Manganese

Molybdenum

Nickel

Palladium

Platinum

Potassium

Selenium

Silicon

Silver

Sodium

Strontium

Thallium

Tin

Titanium

Tungsten

Vanadium

Zinc

Zirconium

13.3.5

13

POST DIGESTATE SPIKE SUMMARY

Login Number: JB37147

Account: ALNJ - Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21026
Matrix Type: SOLID

Methods: SW846 6010C
Units: ug/l

Prep Date:

Metal

Associated samples MP21026: JB37147-1, JB37147-2, JB37147-3, JB37147-4

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(**) Corr. sample result = Raw * (sample volume / final volume)

(anr) Analyte not requested

13.3.5
13



General Chemistry

QC Data Summaries

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Percent Solids Raw Data Summary

Percent Solids Raw Data Summary

Page 1 of 1

Job Number: JB37147

Account: ALNJ Accutest New Jersey

Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: JB37147-1 Analyzed: 20-MAY-13 by HS Method: SM21 2540 B MOD.
ClientID: AOI-5_MW-441_8-10'_51513

Wet Weight (Total)	33.735	g
Tare Weight	18.287	g
Dry Weight (Total)	30.95	g
Solids, Percent	82	%

Sample: JB37147-2 Analyzed: 20-MAY-13 by HS Method: SM21 2540 B MOD.
ClientID: AOI-5_MW-441_0-2'_51513

Wet Weight (Total)	42.364	g
Tare Weight	29.101	g
Dry Weight (Total)	41.107	g
Solids, Percent	90.5	%

Sample: JB37147-3 Analyzed: 20-MAY-13 by HS Method: SM21 2540 B MOD.
ClientID: AOI-5_MW-449_2-2'_51513

Wet Weight (Total)	38.944	g
Tare Weight	26.163	g
Dry Weight (Total)	37.535	g
Solids, Percent	89	%

Sample: JB37147-4 Analyzed: 20-MAY-13 by HS Method: SM21 2540 B MOD.
ClientID: AOI-5_MW-445_3-3.5'_51513

Wet Weight (Total)	36.116	g
Tare Weight	21.123	g
Dry Weight (Total)	33.38	g
Solids, Percent	81.8	%



General Chemistry

QC Data Summaries

Includes the following where applicable:

- Percent Solids Raw Data Summary

Percent Solids Raw Data Summary

Page 1 of 1

Job Number: JB37147

Account: AQTPAW Aquaterra Technologies, Inc.

Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: JB37147-1 Analyzed: 20-MAY-13 by AMA Method: SM21 2540 B MOD.
ClientID: AOI-5_MW-441_8-10'_51513

Wet Weight (Total)	33.735	g
Tare Weight	18.287	g
Dry Weight (Total)	30.95	g
Solids, Percent	82	%

Sample: JB37147-2 Analyzed: 20-MAY-13 by AMA Method: SM21 2540 B MOD.
ClientID: AOI-5_MW-441_0-2'_51513

Wet Weight (Total)	42.364	g
Tare Weight	29.101	g
Dry Weight (Total)	41.107	g
Solids, Percent	90.5	%

Sample: JB37147-3 Analyzed: 20-MAY-13 by AMA Method: SM21 2540 B MOD.
ClientID: AOI-5_MW-449_2-2'_51513

Wet Weight (Total)	38.944	g
Tare Weight	26.163	g
Dry Weight (Total)	37.535	g
Solids, Percent	89	%

Sample: JB37147-4 Analyzed: 20-MAY-13 by AMA Method: SM21 2540 B MOD.
ClientID: AOI-5_MW-445_3-3.5'_51513

Wet Weight (Total)	36.116	g
Tare Weight	21.123	g
Dry Weight (Total)	33.38	g
Solids, Percent	81.8	%
